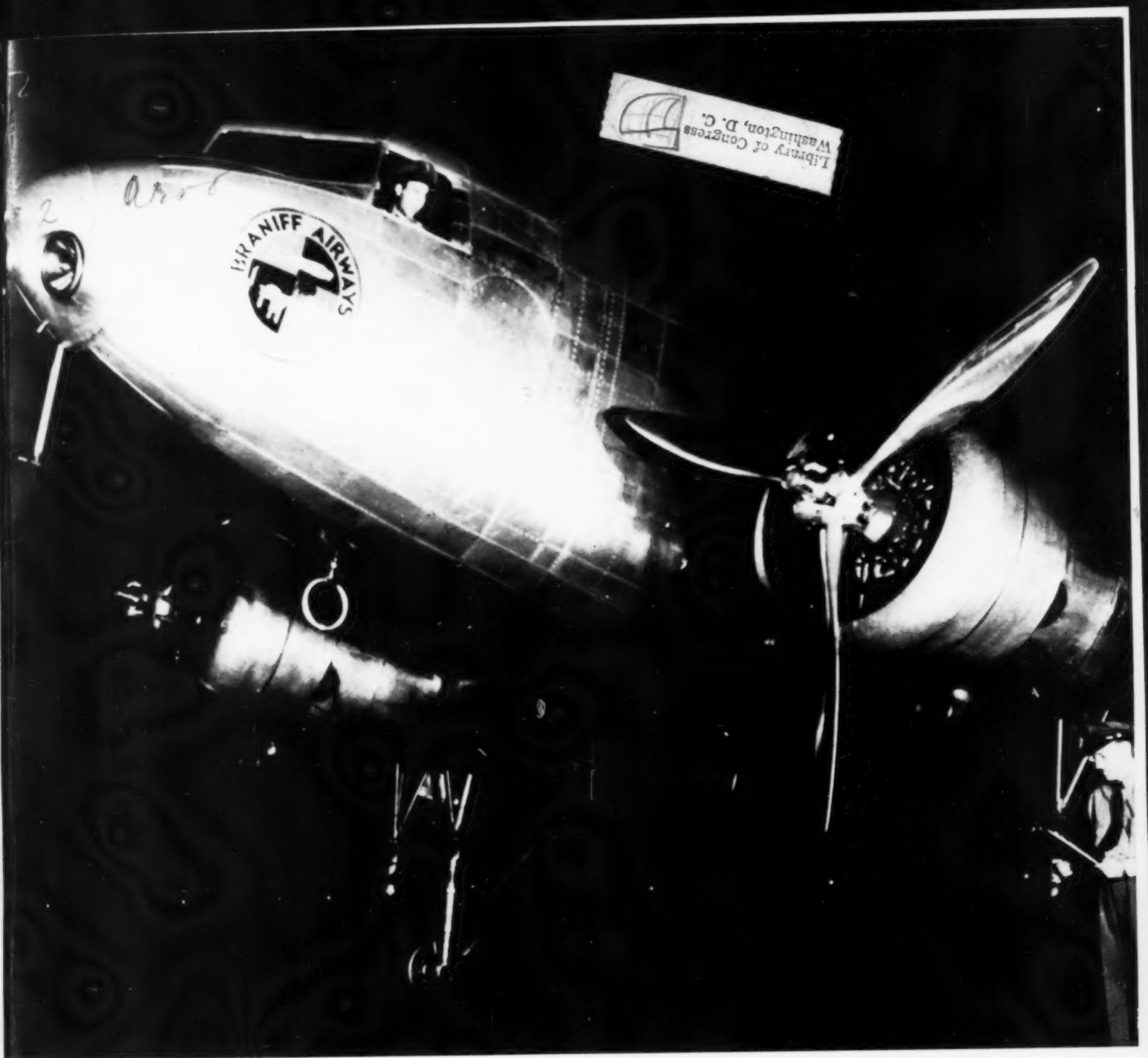

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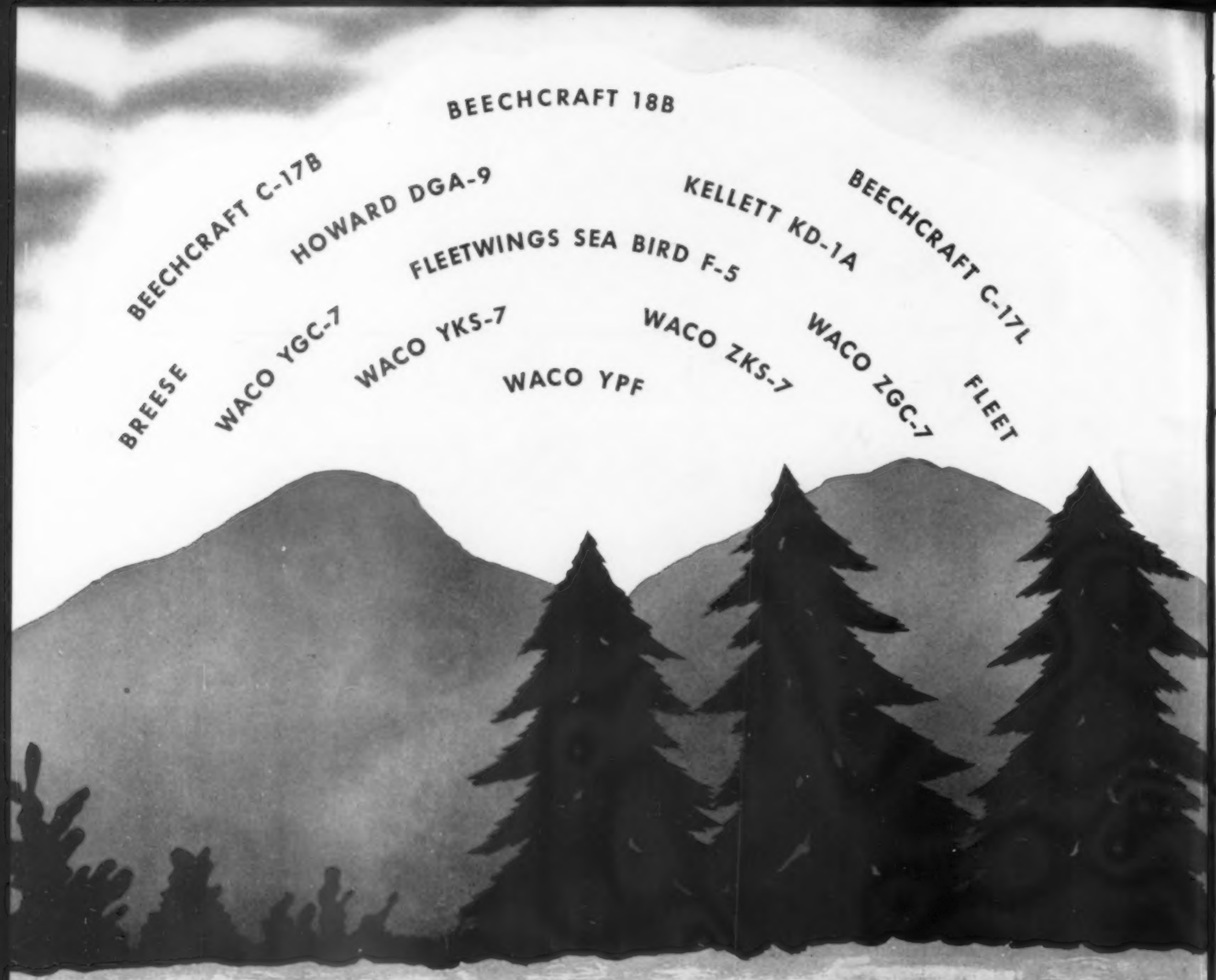

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. . . on the acquisition of five new Douglas DC-2 airplanes and its improved service from the "Great Lakes to the Gulf."

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Southern Flight

The Complete Monthly Digest of Aeronautics in The South and Southwest

JUNE, 1937 VOL. VII No. 6

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The Cover:

One of the five DC-2's Braniff Airways has placed in service over its Great Lakes to the Gulf route. Augmenting its fleet of Lockheed Electras, the new Douglas equipment will serve on through schedules between Chicago and Brownsville.

In keeping with the line's remodernization program, a new division of Spanish speaking hostesses have been added to the crew personnel of the Douglas fleet. (See page 5 et seq.)

★ ★ ★ ★ ★ Just Among Ourselves ★ ★ ★ ★ ★

D of C Prohibition

THE recent decision of the Department of Commerce to prohibit all future over-water stunt flights by refusing to grant permits offers a new slant on aviation regulation that deserves serious thought. The ruling is extremely drastic and inclusive. It will arouse considerable discussion and heated attacks similar to those already evoked by the recent turn-down on the New York to Paris race sponsored by the Aero Club of France.

In announcing its decision, the Department pointed out that long over-water flights usually are made with airplanes that are over-loaded and not otherwise safe due to dangerous flight conditions imposed. Furthermore, the risk of failure in completing the flights was felt to be extremely detrimental to both existing and prospective trans-oceanic passenger services.

Manifestly the attitude expressed is correct when it seeks to discourage purely publicity flights which are made by individuals who do not have the proper mechanical equipment or experience and who are not of a mind that can grasp the difficulties that must be met in such a hazardous undertaking. Allowing such persons to fly to possible suicide can benefit neither humanity nor aviation.

Bearing all this in mind, however, it still must be admitted that the skies should forever remain free to the navigation of any man capable of fulfilling his mission in the same manner as the heritage of the freedom of the seas. There is no justification for barring any pilot whether he be a sportsman, scientist, or air line operator from setting out over the ocean so long as he has the necessary equipment and experience and weather conditions are favorable. *Southern Flight* voiced its opinion several months ago against the Paris race on the tenet that it was ill-timed, sorely endangering the public's acceptance of the transatlantic service now in the final stage of preparation. The lure of prize money might too easily have ended in harmful tragedy at the expense of commercial aviation and useless loss of life as well.

But for the future, regulations are needed to determine what flights can and cannot be made in the interests of safety; they should be effected immediately. Then all those who qualify under sane regulation may carry out their missions unhindered.

Aeronautics can thrive only on sensible regulation; there can be no real progress under the ban of empirical prohibition.

Federal Value of Airports

EMERGENCY relief organizations have been a boon to airport construction and improvement during recent depression years. Although the value of these expenditures to aeronautics cannot be over-estimated, a study of terminal facilities will show that local taxpayers have provided the great portion of airport development expense throughout the years with no thought of the broad public service or national service automatically rendered. The idea has been local civic pride and necessity.

Every airport is of distinct Federal value, whether we consider it from the standpoint of interstate commerce or from the point of view of national defense. Strangely enough, the government has not and is not at the present time sharing its part of the load, commensurate with actual value, save for temporary emergency expenditures.

The advent of huge, four-engined transports, soon to go into transcontinental service, necessitates immediate planning and actual construction work on major airports, alternate and intermediate fields to the end that they will adeqautely take care of the very evident demands for more space, longer runways, better approaches. In short, a permanent Federal policy is now mandatory. It would provide Federal financial aid just as in the case of federal aid for highways, computed on the basis of actual value to the government, including maintenance of lighting systems and proportionate assistance in the maintenance of runways and ramps.

Unless we institute immediately some form of national planning and uniform development, with the Federal Government paying its share of the costs based on permanent Federal values, the towns and cities upon whom the burden of airport development has always rested cannot be expected to carry the load of enlargement and remodernization expenditure which is immediately necessary in many localities.

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PERSONAL MESSAGE

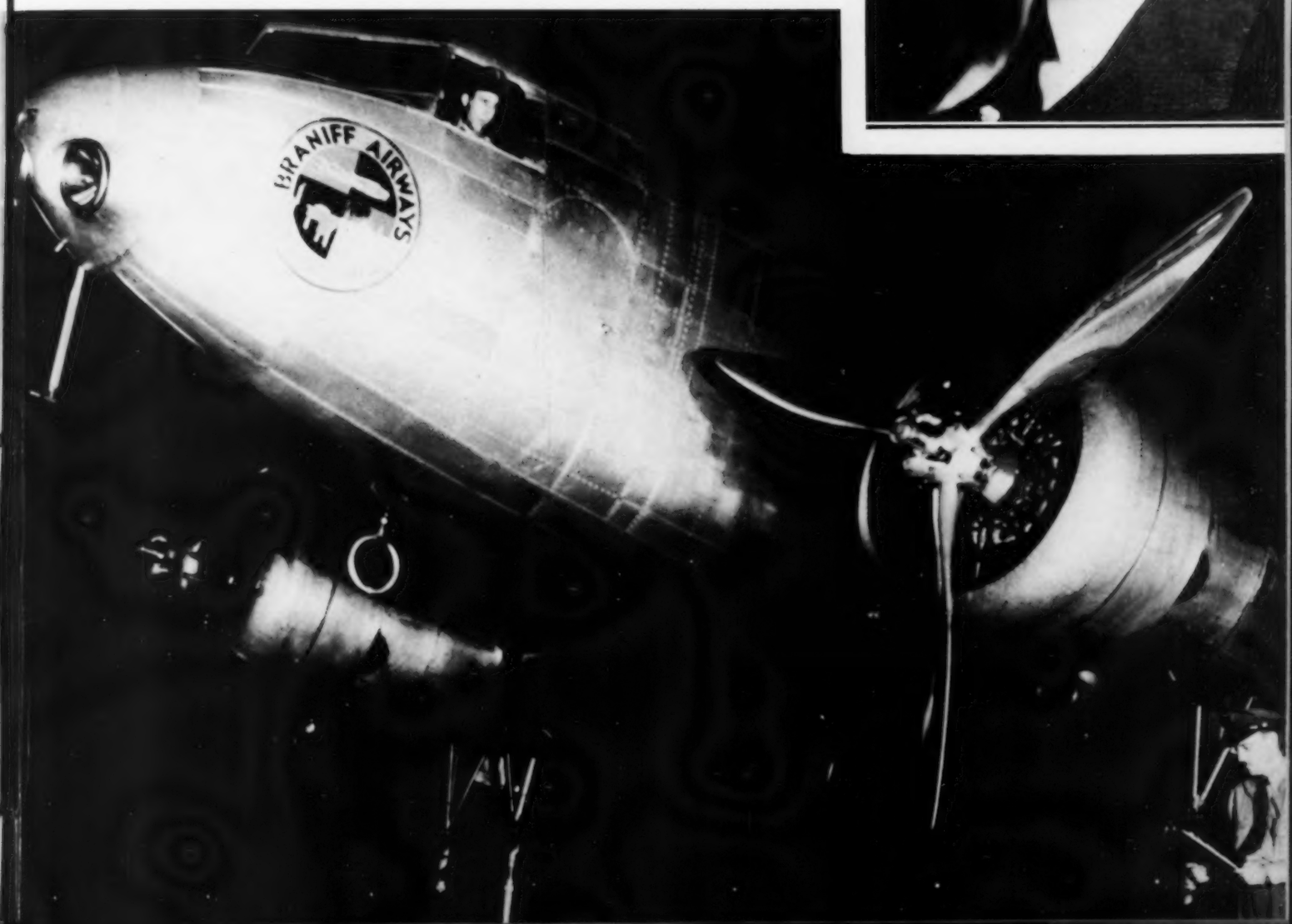
from T. E. BRANIFF, President, Braniff Airways, Inc.

THIS month turns a new page in another chapter of the history which is Braniff Airways. A new fleet of Douglas airliners begin operation on through schedules between Brownsville and Chicago . . . a new department of Spanish-speaking hostesses lend dignity and charm to the handling of passengers in flight . . . new shop equipment and additional personnel render a still greater efficiency to a maintenance record of which Braniff Airways is justly proud.

The measure of commercial aviation of today is not to compare the achievements of any individual line with those of another. Rather, it is the direct comparison of a unified system of the nation's air lines with the existing air transportation facilites of a decade ago, and with the degree of development of other transportation media of today.

No longer can aviation be regarded as a lusty, alluring infant of story-book romance. In an amazingly brief span of years, commercial air transport has grown from a somewhat dreamy conception to an established position in world transportation. We have replaced the spectacular, feathery garb of romance and ballyhoo for a more prosaic mantle that plants us in the category of business men with a definite and necessary service to sell. Constant improvement in that service is the primary watch-word of commercial aviation in America.

So it is that Braniff Airways modestly considers its new service a vital contribution to transportation, particularly to the progress of commercial aviation. Through the medium of *Southern Flight* it takes both privilege and pleasure to give the aviation world some account of the story, the scene and the setting which makes this new chapter in Braniff's history.



On The "B" Line

Business, booming on the "B Line," necessitates five new pieces of flying equipment, inauguration of a unique hostess service and construction of a super-maintenance base.

A. T. BARRETT, JR.

WHEN an air line purchases new equipment, it's news to the industry; when a line adds hostesses where co-pilots once attended to the comforts and whims of passengers, that's news also; when a line sets out to build a maintenance base second to none, that, too, is major news. But when an aggressive outfit blasts out with all three, it's time to go in for Hollywoodish adjectives, projecting on the aviation screen such terms as *stupendous, colossal, terrific.* Although our inborn modesty will not permit such outlandish descriptives, the occasion of Braniff Airways' expansion program this month demands signal notice from the B line territory and hearty congratulations from the entire industry.

Plans for the inauguration of the new services were not predicated on a shallow basis. During the past two years, the consistent upward swing of passenger, mail and express traffic demanded expansion in every department, as the following figures of rapid growth will bear out: In June, 1934, Braniff schedules flew 9,671,210 air mail pound miles as compared to 34,300,912 air mail pound miles in April this year—an increase of 254% for that period. During April, 1935, Braniff flew 2,695,465 express pound miles compared with 8,621,696 in April, 1937—an increase of more than 219%. Revenue passenger miles this year represent an increase of 1,790% over revenue passenger miles for April, 1935. Scheduled miles flown daily at the end of this two year period show a gain of over 58%. Boiled down to a simple statement, that's increased business! To some it might sound like a Jack-in-the-beanstalk fable. But to the industry it's a story of steady progress based on perseverance and vision.

The Braniff name came into aviation history back in June, 1928, when Paul Braniff began operating three round-trip flights daily between Oklahoma City and Tulsa with one Stinson cabin airplane. After pioneering many of the routes now flown by the system, Paul incorporated the present company on November 3, 1930. From that date on through the never to be forgotten days of 1934 to the present, Braniff's history has been one of steady growth and expansion, and the route has spread out to cover the main population centers from the Great Lakes to the Gulf of Mexico. On May 7, 1934, Braniff received the air mail contract from Chicago to Dallas via Kansas City, Wichita and Oklahoma City. The first flight was made ten days later.

On January 1, 1935, they acquired Long and Harman's air mail route, which is now designated as the southern division of the line. By July of '35 the need for larger and faster equipment became apparent and a fleet of six new Lockheed Electras were purchased. So from a lone Stinson in 1928 on through the Vega era in 1934 with a daily schedule mileage of less than 4,000 miles, the B Line has grown in three years to Electras and Douglas DC-2s with a daily scheduled mileage of almost 8,000 miles. It is significant that the new Douglas airliners do not supplant the Lockheed Electras—they *augment* them.

Braniff's increase in passenger traffic, mail and express is not due, they will tell you, to any one individual's ideas, efforts or genius. Instead, it has been the combined efforts and ideas and energies of a closely-knitted organization, working in harmony, blending itself into a common purpose. The company points with pride to a progressive method of modern merchandising, the results of which are best manifested in the increase figures quoted above.

When in 1935 they purchased the present fleet of speedy Electras, investing what seemed then an unwarranted amount of money because of slim load factors and low mail pay, the investment was made with the firm conviction that by offering an increased *supply*, which included up-to-date equipment, better schedules, more comfort and bi-motored safety, a *demand* would be stimulated over and above the normal increase in air line traffic figures. It is with the same reasonable conviction that the company is supplementing its present fleet, that the demand will be over and above the natural expectation of air traffic increases.

Heretofore, additional sections were impossible although oftentimes needed. With the new equipment, Braniff's fleet may fly additional schedules whenever it becomes of practical value. The rich territory served, following established avenues of traffic, appears strongly

to be a logical field to be protected with larger and additional transports.

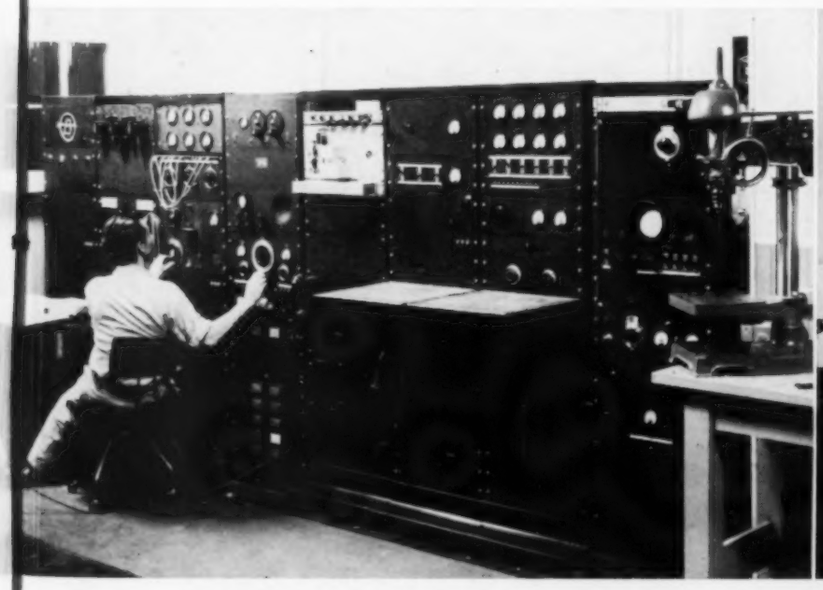
Braniff, fully cognizant of how extremely perishable their product is—that a seat on any flight of any scheduled airliner is decidedly a lost quantity if unsold—also recognizes by the same token the fact that any scheduled flight if sold out and expectant passengers are subsequently forced to use other forms of transportation, represents a definite loss in revenue. Hence the emphasis on extra sections between focal points, based on past experience and conservative expectations.

The company has long recognized that to the major air lines, air hostesses have proven their weight in gold. The new equipment now permits them to afford the gracious atmosphere that only an air hostess can create through her training and ability. The importance of Braniff's international connection at Brownsville on the Mexican border with Pan American Airways, the steadily growing traffic of Latin American customers pouring into the States thereby, seem valid reason for the hostesses to speak Spanish fluently. This quality, in addition to the rigid requirements of weight, height, training, education, personality and background established by other operators, presented an extremely difficult problem when it came to employment of the girls. Consequently, before the first ten hostesses began their tour of duty, approximately 3,500 applicants were interviewed. The girls have completed a rigid course of instruction which was held in Dallas at operation headquarters under the able tutelage of Thelma Jean Hiatt, senior hostess of TWA, and "Bobby" Burton, secretary to vice-president and general manager, O. M. Mosier. From theory of flight to the most minute item of care in greeting passengers, the hopeful and pretty bilinguists have been guided and educated to the point where they are placed in the field of service with every confidence that they will conform to the high ideals and traditions the industry and their forerunners have set for them.

They will have somewhat of a precedent in living up to the co-pilots who diligently applied themselves to proper handling of passengers in flight after inauguration of Electra service in 1935. The result of the co-pilots' efforts to please passengers is best indicated by Braniff's voluminous file of unsolicited letters from patrons who have been pleased with the service to the extent of writing the home office expressing gratitude for the gentile and friendly service rendered during flight. As flight detail procedure increased it became more difficult for co-pilots to spend as much time with passengers. With the hostess service, Braniff believes the girls can do as good a job as the co-pilots and add the feminine touch along with full time availability.

No small part of Braniff's 1937 expansion program is the enlargement and re-modernization of the overhaul and maintenance base on Love Field at the operations headquarters in Dallas. Here, under the leadership of "Red" Mosier, L. H. Luckey, Reagan Stunkel and a roster of technicians and mechanics of the highest qualifications, Braniff's successful operation record will be carried on as effective testimony to the tenet that proper maintenance means the very existance of any operator. No cost has been spared to make the Braniff shops second to none. Every modern machine, tool and device are available with technicians constantly in the lab, devising new methods of inspection and maintenance which will guarantee 100% safety, simplicity and operating economy. From the Magnaflux system of inspection which detects flaws in metal parts indiscernable to the naked eye to the dust-proof, instrument repair shop, modernity and efficiency are key-notes of the Braniff shops. From experiments with the cathode ray for the correction of error in directional gyros to the development of photographic methods of minute-by-minute flight logs, the maintenance base hums with activity and progress.

Finally, an expansion of the sales, advertising and publicity methods under the guidance of Vice-President and Director "Chuck" Beard, in charge of traffic, goes forward to further educate the traveling public with the improved commodity they have to sell. And the job they do, Braniff promises, will be a credit to the industry as well as to themselves.



Left: In Braniff's radio laboratory careful, regular inspection is given to the company's radio equipment. A new unit radio has been installed in all the Electras as well as in the new DC-2's. The new set is designed to carry ten frequencies. Right: Braniff's up-to-the-minute instrument shop. Air conditioned so instruments may be calibrated and repaired in dust-proof air, the shop is under the meticulous supervision of Walter Hendricks.

Powerplant Trends

GEORGE J. MEAD
Vice-President and Chief Engineer
United Aircraft Corporation

Part II: Future Requirements

WE MUST anticipate now the day when power requirements will exceed the capabilities of the existing standard engine types. To do so intelligently requires that we analyze the powers likely to be required and the influence of the power plant on the aerodynamic efficiency of the airplane as a whole. The total power required is influenced both by the size of the airplane and by the cruising speeds that must be maintained. This is illustrated in Fig. 11, which shows power requirements of typical four-engined landplanes of similar design and equal wing loading. It is evident that much greater power will be required whether the trend is toward larger airplanes cruising, let us say, at 200 mph. or to somewhat smaller craft to be operated at higher speeds. Much greater airplane speeds can be provided, but there is a question as to whether such equipment could be made profitable. A balance must be struck among speed, size, and revenue, as has been the case in other forms of transportation. It is not my intention to prognosticate on the rate of airplane development, but simply to show by this brief review the imminent need for engines of considerably greater power.

Number of Engines Per Airplane

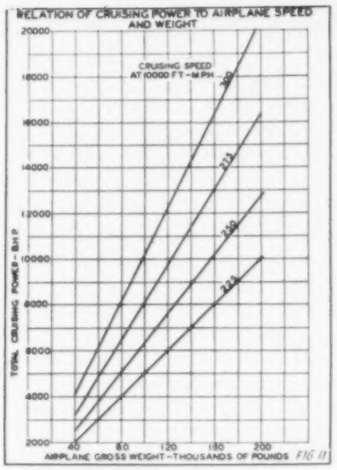
Engine size is influenced by the number per airplane, while the power required per engine in a particular airplane depends both on the schedule to be met and on the safety factor. Dependable service is synonymous with reserve power. Lines with schedules requiring over 80% of the rated power of the engines are late 50% of the time, while the periods between overhauls are more or less inversely proportional to the percentage of power used. This situation has led to designing the new equipment so that it will normally meet the required schedule with 65% of the rated power. The reserve power thus provided is the best possible insurance for maintaining schedules under adverse weather conditions. Two engines are, in my opinion, the very minimum that should be employed in transporting passengers, as the minimum requirement for safety is at least 50% of the total engine power at all operating altitudes. A four-engined machine designed to meet the required schedules with 65% of its rated power has 15% reserve for bad weather with one engine dead. Six engines may ultimately be preferred for transoceanic service on account of the added safety. Design considerations may also favor this arrangement, as it permits of better distribution of load and stress in the wing, as well as of minimizing the weight and size of the propellers. The take-off conditions are definitely improved, since there is a more complete coverage of the wing area with slipstream.

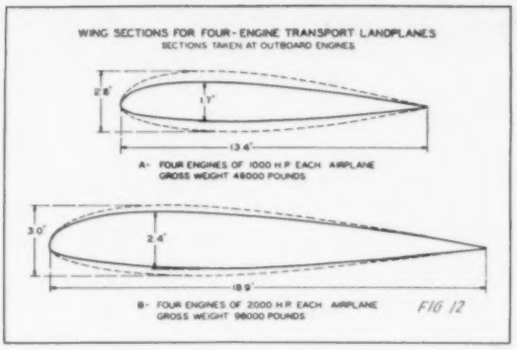
Assuming that land transports of at least 100,000 lb. will be required in the not-too-distant future with cruising speeds of at least 225 mph., or somewhat smaller craft cruising at higher speeds, a total cruising power of 5000 bhp. is needed. This means that engines of at least 2300 take-off power will be required, based on four per airplane and on the present practice of cruising with 65% of rated power. Even larger engines are likely to be required in the same period for flying boats. The importance of take-off power on the amount of payload which may be carried has led us to give each engine a take-off rating of approximately 20% in excess of its standard rating. Normally this is required but for a few minutes, but I feel that its use should not be limited in an emergency and that it should be available at the highest fields on the route.

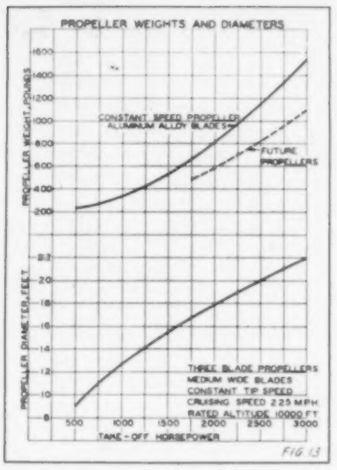
Powerplant Drag

Operators, although keenly aware of the advantages of low specific consumptions, sometimes overlook the much more significant index of fuel expense and weight per ton-mile. The total power being employed to maintain the schedules is, after all, likely to influence fuel costs and weight even more than does the specific consumption. The airplane itself is now particularly clean, so that what hitherto were minor losses have become major. In this category are the form and cooling drags of the power plant. Our studies show that these two items absorb approximately 25% of the thrust horsepower for a 48,000-lb. airplane with air-cooled engines and conventional cowls and a cruising speed of 225 mph. at 10,000 feet. Form drag depends largely on the cross-sectional area of the cowl surrounding the engine. Consequently, it seems reasonable to suppose that the form drag of the radial is greater than that of the in-line in the relation of perhaps 3 to 1. On the other hand, the cooling surfaces for the radial are part of the engine itself, while liquid cooling requires a separate radiator which may add not only cooling drag, but form drag as well. In most installations to date these additions make the total powerplant drag of the liquid-cooled engine practically as great as that of the air-cooled.

The engine form drag can be nearly eliminated by placing the engines entirely inside the wing. Unfortunately, the wing thickness and taper ratios of modern airplanes, as dictated by aerodynamic and structural considerations do not provide sufficient room, particularly for the outboard engines. This is illustrated on Fig. 12 which shows wing cross-sections at the outboard engines for two land transports with four engines of a total of 4,000 and 8,000 hp. respectively. The solid lines represent normal sections, and the broken lines show the airfoils that would be necessary to house suitable engines. As will be seen from the dimensions, there is insufficient room for even the flattest of powerplants within the normal wing section, although this difficulty diminishes as the airplane becomes larger. The situation is somewhat better in the case of flying boats with their higher power loadings. A possible solution for the landplane is the use of thicker sections which will increase the local profile drag of the wings by about 30% for the smaller ship and 15% for the larger, but since the entire wing need not be made deeper, the average profile drags will rise by only about 12 and 6% respectively in the two cases. The approximate effect on power required at constant cruising speed would be represented by an increase of 4% for the smaller airplane and 2% for the larger. The engine form drag, although eliminated, is replaced by the drag of the propeller support, which is estimated to absorb 4% of the power. Taking this into consideration and allowing for the added thickness of wing necessary in the two cases, the powerplant should be charged with 8% of the thrust horsepower for form drag in the smaller


RELATION OF CRUISING POWER TO AIRPLANE SPEED AND WEIGHT
CRUISING SPEED AT 10000 FT - M.P.H.
TOTAL CRUISING POWER - B.H.P.
AIRPLANE GROSS WEIGHT - THOUSANDS OF POUNDS
FIG 11


WING SECTIONS FOR FOUR-ENGINE TRANSPORT LANDPLANES
SECTIONS TAKEN AT OUTBOARD ENGINES
A- FOUR ENGINES OF 1000 H.P. EACH AIRPLANE GROSS WEIGHT 48000 POUNDS
B- FOUR ENGINES OF 2000 H.P. EACH AIRPLANE GROSS WEIGHT 98000 POUNDS
FIG 12



ships and 6% in the case of the larger.

It should be noted that even after thickening the wings materially to accommodate the power plants, there is still insufficient room to permit reaching the engines during flight, much less doing any work on them. I believe this will be practicable only when wing thicknesses of five or six feet can be employed. However, continued improvement in high-lift devices and consequent reduction in wing area are constantly making this problem more difficult.

The disadvantages of placing the engines inside the wing are primarily due to the disturbing effect on normal balance resulting from moving the engines so far aft, to the effect on the wing structure, and to the impaired engine accessibility. Despite these disadvantages, the reduction in operating cost may be sufficient to warrant serious consideration of ways and means of overcoming them. These problems will probably solve themselves in the larger ships of the more distant future.

Granted that it is now impracticable to place the engines inside the wing, there are still opportunities for materially reducing the form drag. The propeller should be located for aerodynamic considerations approximately one-half its diameter ahead of the wing. The "wetted surface" of the nacelle is then a function of propeller location rather than of engine length. In any case some sort of supporting structure is required which must be both rigid and suitably faired into the leading edge of the wing, and such a structure, if of proper size and shape, actually improves the propulsive efficiency. This would indicate that the best alternative to submerging the engine in the wing would be to reduce its cross-section to the minimum and utilize it as the propeller support. Such an engine with small cross-section would necessarily be long. Engine length, however, is not, after all, a factor since there is ample room for even the longest in-line engine between the propeller and the forward wing spar, or the box in monospar construction.

Concerning cooling drag, it must be realized that its accurate segregation from form drag requires that it be defined in terms of a cooling power equal to volume flow of cooling air multiplied by pressure drop through the engine or radiator. Bench tests indicate that the requisite engine operating temperatures could be maintained by the expenditure of only two or three per cent of the brake horsepower, either for a radial engine under a conventional low-drag cowl or for a liquid-cooled engine with a conventional radiator. Unfortunately, this low cooling drag cannot be had for the radial engine without its high form drag. In the case of the liquid-cooled system it has been customary to add form drag to secure the requisite cooling, as in the case when external tunnel radiators are used. The ideal solution is the use of surface or wing radiators as exemplified in racing airplanes. This does not entirely eliminate cooling drag, since some additional wing area is required to take care of the greater weight of such a system. The cooling drag should be charged with a minimum of 2% of the thrust horsepower after allowing for the additional weight, including that of the auxiliary radiator needed to deal efficiently with take-off power for a prolonged period.

Recent radiator developments indicate that form drag may be eliminated by submerging the radiator in the wing or fuselage. This, coupled with low-resistance cores, may reduce the radiator drag to one-third of the combined form and cooling drag of the external tunnel radiator. This would make the cooling drag comparable to that of the air-cooled engine if no scoop were necessary, although the improvement is not quite so marked after due consideration is given to the additional wing area necessitated by the greater weight of the liquid-cooled system. The reported cooling-system weights for high-temperature cooling vary considerably, but .30 lb/hp. seems a fairly representative figure. It is estimated, therefore, that a minimum of 5% of the thrust horsepower would be required to overcome the cooling drag. Surface radiators, of course, will become less attractive if it is possible to achieve this theoretical figure with the submerged radiator.

Considerable progress is being made meanwhile in improving air-cooling technique. The actual cooling drag of the present standard air-cooled installation with low-drag cowl requires from 5 to 6% of the thrust horsepower. As previously indicated, it has become necessary to increase the mass flow of air over the cylinders to obtain satisfactory cooling with the higher outputs, but further refinements in cowl shapes and air passages nevertheless give promise of additional reductions in drag, particularly at cruising speeds. It seems probable that the required cooling drag for air-cooled engines of small frontal area used as propeller supports or totally submerged in the wing would be on the same order as that required for liquid-cooled engines with submerged radiators. This conclusion is reached on the assumption that a forced flow of cooling air could be provided in which the entrance and exit for the cooling stream were so designed and located as not to cause interference or form drag. The total powerplant drag in such cases would then be influenced principally by the cross-section of the engine and its effect on the form drag.

It should be noted that, despite the periodical controversy over the merits of air and liquid-cooling, the performance of similar airplanes with the two systems has been comparable. Improved radiators and better location are reducing the drag of the liquid-cooled system. It is possible that this improvement will be offset by the decided reduction in frontal area afforded by the two-row air-cooled engine and the improvement in its cooling technique. In any event, there is a decided opportunity for reducing the powerplant drag with both the air- and liquid-cooled types of engines. It seems reasonable to expect that at least half of the drag of present commercial installations can be eliminated, which will mean a reduction in power required of some 12%.

Propellers

A PROPULSIVE efficiency of 88%, although possible of achievement under proper conditions, is readily impaired, with consequent penalty to operating expense. It is, therefore, important to provide adequate propeller diameter and properly designed blades turning at the most efficient speed and in the optimum location. The curves of Fig. 13 give an idea of the appropriate diameter and weight of suitable three-blade constant-speed propellers for airplanes cruising at 225 mph. at 10,000 feet with 60% of their take-off power. Taking the case of an engine with 2,400 take-off horsepower, it will be seen that an 18-foot propeller is required, which weighs approximately 800 lb. The curves of Fig. 13 show that the weight of metal propellers is increasing rapidly with diameter. For this reason, intensive development work is being carried on which gives promise of reducing this weight by approximately a third, as shown by the dash line. The diameter of the propellers required by the large engines is sometimes disturbing to airplane designers accustomed to thinking in terms of much smaller sizes. The increasing airplane size, as indicated by Fig. 14, tends to offset the disadvantages that might at first be contemplated.

Various arrangements have been proposed to reduce the distance from the center line of the airplane to the outboard propeller, such as gearing two or more engines to one shaft or employing double concentric propellers. The use of a single large propeller driven by two or more engines gives the maximum propeller diameter and weight. The double concentric arrangement gives the minimum propeller diameter and weight. Unfortunately, the take-off thrust is seriously impaired because of the inadequate disc area. The most efficient arrangement, seems therefore, to be a single propeller of adequate diameter for each engine.

Weight

The weight of the complete powerplant contributes to the total drag of the airplane due to its influence on wing area. Weight alone is, however, not the true criterion, but rather its effect on the overall efficiency of the airplane. The constant-speed propeller is illustrative of this, since it weighs 20 to 60% more than the fixed-pitch but permits taking off 10 to 30% greater gross weight.

The dry engine weight of a modern air-cooled transport engine complete and ready to run, as equipped for commercial service, is approximately 1.30 lb. per take-off horsepower. I gather from the published data on liquid-cooled engines that a comparable figure for them is 1.60 lb. In this connection it may be noted how little the engine weights for a given power are influenced by type, providing each is thoroughly developed for the same service. Actual dry weights of 9- and 14-cylinder air-cooled, as well as of Vee and flat 12-cylinder liquid-cooled engines are as a matter of fact quite comparable, probably due to the difference in displacement required. Some astonishingly low weights have been published but experience indicates that the weights come into line as these powerplants are developed to give satisfactory service. The specific weight has decreased slowly in recent years, due to the addition of propeller reduction gears and superchargers, and the insistence on longer periods of operation between overhauls.

I see no real opportunity for materially reducing the specific engine weight at the moment. As a matter of fact, it may be necessary to increase it to secure the minimum cruising fuel consumption. On the other hand, it is a foregone conclusion that, if such increases are adopted, they will be justified by reducing the operating cost per ton-mile.

Summing up the future requirements, it is evident that we must be governed by the present demands and past trends as to the power likely to be necessary. Some operators are already thinking in terms of 1500- to 2000-hp. engines. This might be interpreted to mean that such engines will be needed within the next five years, while powerplants of twice these powers are not far off if the recent trends are continued. The analysis of powerplant drag shows the importance of making these big engines of such shape that they may be stowed away in the wings or where this is not practicable, have the minimum form drag when acting as propeller supports. With these points in mind it would seem in order to consider the requisite engine types.

Engine Types for Greater Output

Engine development to date has been concerned main-

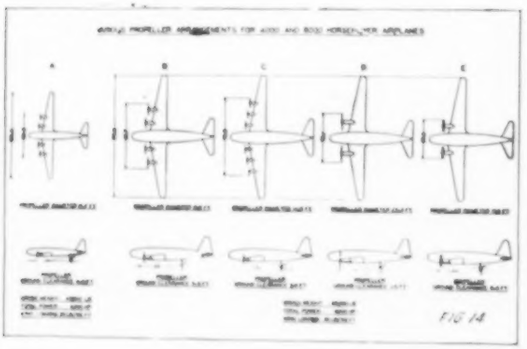


FIG 14

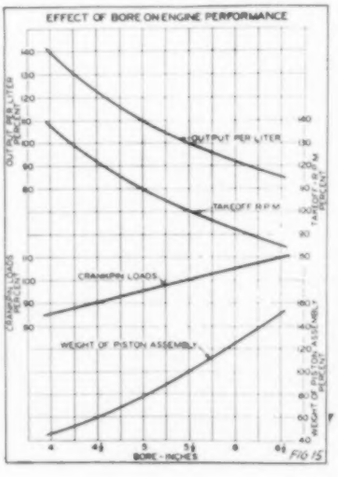


FIG 15

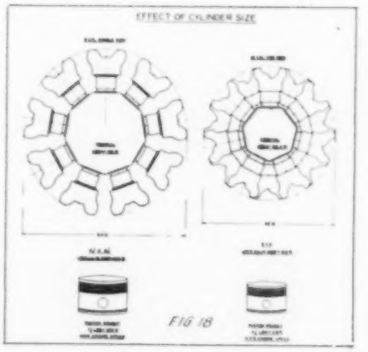


FIG 16

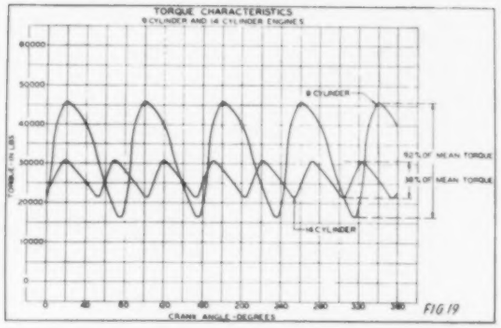


FIG 19

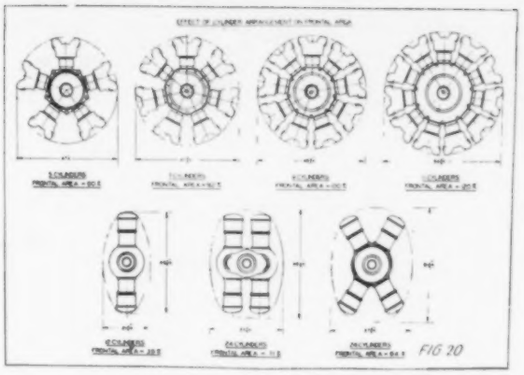


FIG 20

ly with the in-line and the radial. Adherents of the former have worked on the principle of the maximum number of crankpins per shaft, while the latter devoted their initial efforts to the maximum number of cylinders per crankpin. The requirements for greater power and consequently more displacement have forced both groups to the consideration of other types in which a greater number of cylinders can be employed. This has raised the question of the optimum size of cylinder, the number that may be used per engine, and the cylinder arrangement.

Cylinder Size

Cylinder dimensions are a compromise between displacement and operating speed to secure the maximum output per liter consistent with reasonable cost. The maximum size of cylinder has paobably already been reached and the trend is definitely toward smaller bores, as previously noted. The fundamental advantage of the smaller cylinder is its greater output per liter, as shown on Fig. 15. This is primarily due to the reduction in the reciprocating weights which, in turn, permits higher operating speeds. A further advantage lies in the improved cooling resulting from the shortening of the heat flow paths. This permits greater boost for a given fuel and consequently still further increases the output. No attempt has been made to evaluate this factor in the curve, because we have as yet inadequate information on cylinders of similar design covering a sufficient range of bore. In view of the experience gained in building engines with cylinders ranging in bore from 5″ to 6¼″, I am of the opinion that the 5½″ cylinder makes the best compromise at present between output and cost. This size is therefore considered as the optimum in the following discussion of engine types. It is helpful, in this connection, to consider an output of 100 hp. per cylinder. This is equivalent to 47 hp. per liter, which will no doubt be achieved within the next five years. The trend will undoubtedly be toward even smaller cylinders, as their increased performance justified the added cost.

Connecting Rods

The number of cylinders per pin is determined by the permissible connecting-rod design and by the crankpin bearing loads. Nine cylinders are the most that can effectively be used with a solid master rod. Seven cylinders are the limit with a split rod, due to the lack of cross-section between the split and the adjacent knuckle pins, as well as to the difficulty of making satisfactory provision for the clamping bolts. This condition is illustrated on Fig. 16, showing the evolution of our two-row master rods. The permissible number of cylinders is also influenced by the crankpin loads, particularly as the operating speeds are raised; this consideration tends further to reduce the number of cylinders per pin.

Crankshafts

Present practice indicates that at least six throws per shaft may be satisfactorily used. However, even the six-throw shaft presents a difficult problem in an engine of high power, due to torsional vibration. This condition is somewhat improved where a relatively large number of small cylinders is used, operating at high crank speeds. The fact remains that the forces are considerable and that the wind-up in the shaft is proportionate to its length. For this reason, a greater number of throws still further complicates the problem. Failures of crankshafts, reduction gears, accessory drives, and even propellers have led to a thorough study of the torsional vibration problem. In the United States we are working to variations of plus or minus ½° within the operating range of speeds and powers of our single- and two-row engines. It is doubtful whether sufficient experience has yet been accumulated to say definitely whether this requirement is too severe or not. All we do know is that the torsional vibration difficulties experienced have disappeared when working within these limits. Presumably somewhat larger variations will have to be permitted for shafts with a greater number of pins.

A built-up crankshaft would permit the use of a greater number of cylinders per pin providing such a shaft could be made equivalent to a solid one. Our experience with built-up single-throw shafts may be of interest in this connection. The original and latest designs are shown in Fig. 17. Although the original shaft was satisfactory for 400 hp., failures were experienced in the rear cheeks as the rating was increased, and galling or fidgeting caused cracks in the mating surfaces. To overcome these defects, the design was revised as shown, including the introduction of vibration dampers consisting of steel rollers inserted in somewhat larger cylindrical openings

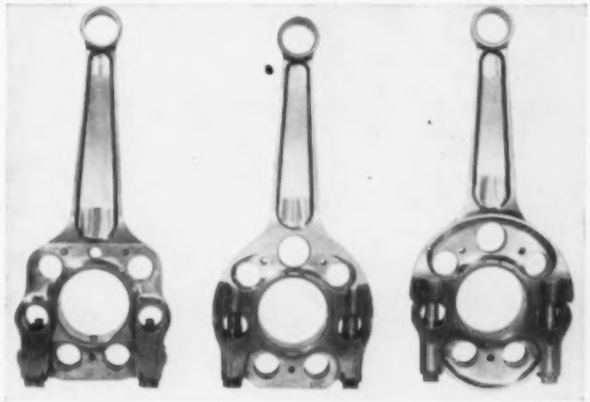


Fig. 16
Connecting Rod Evolution

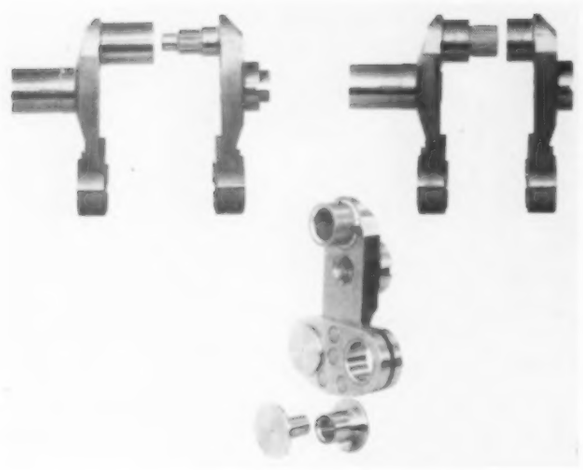


Fig. 17
Comparison of Crankshafts

in the counter-weights. Shafts of this design give every indication of lasting the life of the engine, even though the power has been increased by nearly 50%. Another type of split single-throw shaft is exemplified in the Bristol clamp type. It should be noted that in both these arrangements comparatively little torque is carried through the split. With two or more throws, a considerable amount of torque will have to be transmitted from one portion of the shaft to another. Experience, especially in service, is as yet too limited to evaluate the capabilities of the built-up multi-pin shaft.

Balance and Torque

Good mechanical balance and uniform torque are essential in any engine. These factors are becoming more important with the larger powerplants on account of their effect on the life of the engine and the propeller. Propellers which have satisfactory fatigue characteristics when run with an electric motor have to be made considerably heavier to give equal durability when driven by an internal combustion engine of the same power. Torque variations have also been found to have a decided influence on propeller life; this means that the propeller weight can be reduced with an increased number of cylinders.

Number and Arrangement of Cylinders for a Specific Output

The most satisfactory powerplant from the standpoint of all-around performance and operating cost is that with the requisite number of optimum-size cylinders for the given output. The use of the minimum number of maximum-displacement cylinders, although reducing the first cost, gives a comparatively rough-running engine with a shorter life and usually with the maximum frontal area.

The effect of the number of cylinders on displacement and frontal area may be illustrated by the concrete case of a nine-cylinder single-row versus a fourteen-cylinder two-row, both developing the same power with the same mean effective pressure. Assuming that nine 6¼″ square cylinders are required for the single-row with a total displacement of 1726 cu. in., it will only be necessary to use 5″ square cylinders in the two-row with a displacement of 1375 cu. in. The reduction of 20% in displacement is due to the increased operating speed of the smaller cylinders. A reduction of 11″ in diameter is provided by the two-row, or a decrease in frontal area of 36.6%. This is illustrated in Fig. 18. The comparative torque of the two engines is illustrated in Fig. 19, which shows the decided increase in smoothness of the fourteen-cylinder engine.

The method of arranging the cylinders to a large extent determines the cross-section. The arrangement is influenced by the need of good balance, even torque, satisfactory cooling, uniform distribution, and reasonable bearing loads. These requirements may be met with various arrangements of cylinders. The choice ranges from short engines with large frontal area to long engines with small cross-section. Figure 20 shows four radial combinations of the optimum cylinder and three in-line arrangements. The fontal areas are indicated in per cent of that of the nine-cylinder radial which gives the greatest displacement per crankpin for its projected area. It should be noted that the form drag of the radial types is influenced by cylinder size and not particularly by the number of cylinders per row, while the drag of the in-line is affected by the number of banks, in addition to the cylinder size. Since the total number of cylinders is not a factor, it follows that the form drag of the larger engines is comparatively small per horsepower. The radial combinations lend themselves to use as propeller supports, due to their cylindrical shape, while the more rectangular cross-section of the H and X makes them desirable for submersion in the wings. Radial combinations of at least thirty cylinders appear feasible, while in-line engines of twenty-four cylinders have already been built. Undoubtedly, ways and means can be found to employ even greater numbers of cylinders whenever these become necessary.

Multi-Shaft Engines

Greater power may be secured by the combination of two or more engines in a single unit. Two ways of accomplishing this are illustrated by the Fiat racing engine, type AS-6, and the Napier Halford Dagger. The Fiat is virtually two twelve-cylinder engines placed back to back with a gear box between them. Two concentric propellers, one for each engine, are driven through offset gearing and concentric shafts. In the Napier we have a combination of two flat Twelve united by a common crankcase and driving a single propeller through spur gears. Both these arrangements furnish means of utilizing a greater number of crankpins and therefore increasing the displacement, and consequently the output.

Conclusion

The general trend in engine development continues steadily toward ever increasing outputs per liter, with the consequent effect of improving the take-off powers and reducing the engine size in the geometric sense. There is reason to believe that the rate of progress of the past decade can be maintained, providing our invaluable allies, the chemist, the metallurgist, and the fuel technician, can keep pace with our needs.

The development of the present standard types definitely tends toward smaller cylinders for the higher outputs. This, combined with the general acceptance of the two-row type for the higher powers, has effected a decided reduction in frontal area per horsepower. From the standpoint of performance, take-off powers of 1500 to 1800 hp. seem feasible in the period immediately ahead. The ever increasing importance of operating costs has concentrated attention on this most vital performance characteristic. As a result, great strides have been made in reducing the specific fuel consumption, and there is evidence that service consumptions of .40 lb./bhp.-hr. may be achieved within the next few years.

The evident future needs for engines of from 2000 to 3000 hp. has focused attention on other types in which additional displacement may be provided through the employment of a greater number of cylinders. Two new

(Continued on Page 23)

Lt. J. P. Fraim (left) and football scout J. B. Whitworth, whose travels over the nation in the Fairchild "24" have carried them from coast to coast. The ship is owned by Louisiana State University and is used for student instruction as well as for scouting football opponents.

It is not now too visionary to maintain that a potential market for some 200 airplanes actually exists out of the thousands of institutions of intermediate and higher education in America.

Scouting Via Fairchild

A modern state university covers ground in the modern way and scouts opponents' football teams when the school-owned ship is not training students.

CHARLES MacDONALD

A GREAT deal of flying activity in university towns during the regular sessions, the growing popularity of intercollegiate flying meets and the formation of college flying clubs throughout the nation bears witness to the fact that more and more young men of university age are taking to flight. Far-sighted universities are giving due emphasis to aeronautical training in its various phases. Outstanding among these progressive American schools is the Louisiana State University.

Ranked by most of the country's leading sport writers and observers as one of the major football teams of the nation during the 1936 season, L. S. U.'s gridmen, as well as enthusiastic supporters, are high in praise and gratitude to their flying football scout, J. B. Whitworth, their flying professor, J. P. Fraim, Jr., and their school-owned Fairchild "24" monoplane.

Flying Scout Whitworth, assistant coach on Bernie Moore's staff, and Professor Fraim, who besides piloting the plane on its many trips, heads the University's department of aeronautics, have, during the past football season, flown over many thousands of miles of plains and mountains, deserts and greenwood trees, seeking out the strong and weak points of Louisiana's Bengal Tigers' opponents. To get an idea of distances covered, the little "24" has carried its scouting group to such places as far-away San Francisco, New York City, Washington, D. C., and Houston, with the purple and gold "flyin' high."

Frequently, Whitworth was able to scout games in neighboring states in the afternoon, hop into the plane and fly back to Baton Rouge in time to see his Tiger eleven, battling under flood lights, adding another victory to its impressive list. No wonder the Southeastern Conference football champions are definitely air minded.

However, flying scouts to opponents' games is but one of the uses of Louisiana State University's airplane.

Professor Fraim holds a 1st Lieutenant's commission in the Air Corps Reserve, having come to the University four years ago from one of the Army's crack pursuit squadrons. L. S. U. was the first university in the country to coordinate the three phases of aviation-engineering, commercial and flight training—using an airplane as a veritable research laboratory. The first two branches are divisions of the School of Aeronautics, but the flight training course is open to any student or faculty member of the University.

A student pilot license must be obtained through the Bureau of Air Commerce before instruction will be given. But, in order to encourage student flying, the plane is operated on a non-profit basis entirely. Students are charged a small fee, based on the actual operating costs of the plane per hour.

Under the direction and instruction of the versatile Fraim, a large number of students have sprouted wings during the last semester, including a number of co-eds. The number is steadily increasing and many of the devotees look forward to the time when it will be necessary to acquire still another airplane. The ship now in use is a dual-controlled, three-place Fairchild equipped with all the latest safety devices and is rigidly inspected and overhauled at frequent intervals. The University makes the wearing of parachutes compulsory for instructor, student and passengers, no matter how short the flights may be.

The aeronautical courses offered by L. S. U. and the flight instruction in particular are so popular among students it is confidently hoped that other institutions of similar size and scope will investigate the possibilities offered. Even though some universities and colleges might be slow to include technical and flying courses in their curricula, the practical utility of owning and operating a moderately priced airplane cannot be denied. Truly, the colleges and universities offer a new field of aeronautical development and expansion.

It is not now too visionary to maintain that a potential market for at least 200 new airplanes actually exists out of the thousands of institutions of intermediate and higher education in America that pride themselves on their progressiveness and modernity in educational theory and practice.

Aircraft Parade

V-8 Arrow Sport

LARRY J. FISHER

The V-8 Powered Arrow Sport

MAKING its initial bow to the Southwest in general, the new Arrow Sport, first airplane to be licensed with the Ford V-8 automobile motor, proved to be the attention-getter during the recent Texas Air Tour.

As a private pilot, I have always steered clear of automotive-powered airplanes, for they all seemed to be in the shaky, home-made class to me; consequently, it was without enthusiasm that I accepted the invitation of Dale Myers, factory representative for the Arrow Sport, to "try her out."

I got a real surprise. It flew and handled like a big airplane and the motor, geared to the prop, purred along steadily and extremely smoothly as we cruised along at an honest 90 miles per hour. Using ordinary automobile gas, the motor burns up only five gallons an hour. Landings were another surprise. The geared prop acts as an air brake or flaps and a giro landing can be made in an almost unbelievably short space. Good brakes limit the landing roll to a minimum.

The V-8 installation is interesting. It is an orthodox Ford motor, using standard Ford parts other than one water pump instead of two, generator, oil pan and prop gear. Rated 82 horsepower at 3,075 revolutions, it weighs 402 lbs. Total weight of the ship, pilot, one passenger and 28 lbs. of baggage is 1,675 pounds.

There is a roomy, deep side-by-side cockpit on the Arrow Sport, equipped with dual wheel controls and the low wing job is attractively finished.

An unusual feature of this new ship, pointed out by Mr. Myers, is that testing, after a repair job, need not be done by test flights. Any authorized Ford dealer has special equipment to test every portion of the motor in his shop; this automatically eliminates the danger of test hops in the field. The motor need not be majored because a new replacement block assembly can be purchased for $55 plus the old motor—far less than the average major motor over-haul.

The Arrow Sport is especially attractive to the cross country pilot, for he can secure service (and reliable repairs) almost anywhere at the nearest Ford dealer.

Manufactured by the Arrow Aircraft Corporation at Lincoln, Neb., the production line will probably be up to eight ships daily by winter.

SPECIFICATIONS AND PERFORMANCE

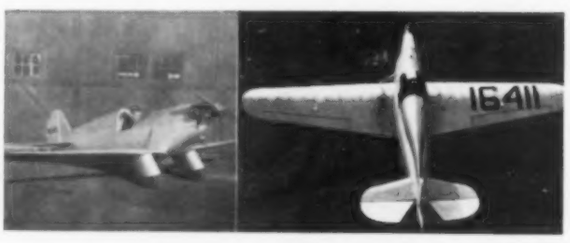
Top speed, 100 mph.
Cruising, 90 mph.
Landing speed, 40 mph.
Absolute ceiling, 14,000 ft.
Service ceiling, 12,000 ft.
Rate of climb, 800 ft./min.
Cruising range, 300 miles.
Span, 36 ft. 9 in.
Length, 21 ft. 4 in.
Height, 8 ft. 10 in.
Wheel tread, 66 in.
Wing loading, 9.3 lbs./sq. ft.
Gasoline, 20 gals.
Oil, 2 gals.
Power loading, 20.4 lbs./HP.
Weight, empty 1150.

Dalrymple Racer

CREIGHTON MERRELL

ONE of the most novel racing lightplanes to appear in this country since the hey-dey of Eddie Heath is the Dalrymple Special light racing monoplane. The airplane, which successfully passed extensive flight tests the first of this year, was designed and built by Wayne Dalrymple, engineer for Stearman Aircraft Company of Wichita, together with Clarence Pfeiffer, welder for the Stearman concern. Design and construction required a total of two years of spare time and the airplane is now housed at the Harte Flying Service Hangar on the Wichita Municipal Airport.

Power plant is the 30 h. p. Aeronca engine and at 2,500 r. p. m. the airplane has been clocked at the amazing speed of 120 m. p. h. The landing speed is only 46 m. p. h. and initial climb rating is 750 ft. per min. The midget proportions of the airplane are at once apparent. The span is 20 ft. 8 in. The overall length is less than 14 ft.



Two Views of the Dalrymple Racer

To date the airplane has been put through every possible maneuver by Pilot Alanson "Dutch" Rawdon with perfect success. It spins satisfactorily in both directions, rolls especially well, and flies upside down with as much ease as right side up until the motor starves out. From a standing start it has climbed to 600 ft. in a single minute.

A most unusual aspect of the Dalrymple airplane is the unconventional construction of the cantilever wing. The basic member is a single solid spruce mono-spar that extends in one piece from tip to tip. Drag construction is made up of a steel tube leading edge and a light dummy spruce rear spar which are tied together by flat wire diagonal bracing. Steel tubes which extend from the dummy spar through holes in the main spar and to the leading edge act as compression members. The NACA M-6 airfoil is used due to the desirable low center of pressure travel and truss type spruce ribs are used. All torsional loads are transmitted into the fuselage at the wing root and the mono-spar carries only simple bending and shear stresses. The finished wing is very rigid torsionally and no trouble concerning wing flutter has shown up in flight tests. A conventional statically balanced wood aileron is fitted to the wing.

The chord at the root of the wing is four feet and at the tip it is only two feet. The aspect ratio is eight and total area measures 60 sq. ft.

The fuselage is of welded steel tube construction with generous spruce fairing to give a pleasing and streamline shape. The largest tube is only $\frac{5}{8}$ x .035 while the smallest is $\frac{3}{8}$ x .035. The cowling is so arranged that an enclosure may be used over the cockpit. The rear end of the fuselage is faired in a rounded contour and the lower part of the rudder is shaped to carry the streamline shape to the rearmost part of the airplane.

The fin and stabilizer are of spruce construction covered with plywood. The elevator is of fabric covered dural structure and the rudder is of wood frame.

The landing gear is of solid welded tube design with all shock absorbtion by air wheels. The wheels are nicely faired in by streamline pants and a single strut transmits the loads to the fuselage.

At the present time it is planned to fit a 40 h. p. Aeronca engine on the airplane with a view to further increasing the performance figures already obtained. If this is done, and it is entirely feasible to do so, the airplane will undoubtedly be in line to set several records of its own.

SPECIFICATIONS

Span	20 ft. 8 in.
Length	14 ft.
Empty weight	287 lbs.
Gross weight	490 lbs.
Fuel capacity	7½ gals.
Oil capacity	1 gal.
Pilot	150 lbs.

Boeing XB-15

"Big Brother" of 4-engined Bombers.

The Boeing B-15 is substantially larger than the YB-17 "Flying Fortress" and has been referred to in Army circles as "one of the greatest weight-carrying airplanes in the world." It is powered by four Twin-Row Wasps of 1,000 h.p. each, and carries two auxiliary gasoline power plants driving an electricity generator for the first complete 110-volt alternating current electrical system ever used in aircraft.

THE largest and most powerful of the United States Army Air Corps' modern aerial defense weapons—the new 4-engined Boeing XB-15 bomber—was being given its finishing touches and final inspection early in June at the Boeing Aircraft Company in Seattle, Washington, preparatory to its first test flights.

The Boeing XB-15, substantially larger than the 4-engined Boeing YB-17 "Flying Fortresses" of the Army Air Corps, and described as "one of the greatest weight-carrying airplanes in the world," has been secretly under development, under Government contract, for nearly three years, with a total of more than 670,000 man hours of labor involved in its design and construction. The all-metal streamlined monoplane is equipped with four 1000 horsepower Pratt & Whitney Twin Wasp Sr. engines, has complete living accommodations aboard for the crew, and carries the world's first full 110-volt alternating current aircraft electrical system with a generator driven by two auxiliary gasoline power plants.

At the controls of the new Army bomber on its initial hops will be Edmund T. Allen of New York, well-known consulting engineer and test pilot, who has been a flyer for twenty years. Educated at Massachusetts Institute of Technology, trained as a pilot and flying instructor during wartime in the Army Signal Corps, experienced as one of the early Army air mail pilots and later as a pilot for Boeing Air Transport, Allen has flown widely in two hemispheres and has test-piloted almost every size and every variety of airplane. Contrasted to his present task of testing the biggest Boeing yet built, his first test-piloting job for the Boeing Company was with the Model 83 of 1928, fore-runner of the series of Boeing F4B Navy fighters and P-12 Army pursuits which are among the smallest United States military planes.

New Sikorsky For Navy

New Sikorsky For Navy

The first of three Sikorsky S-43 amphibions recently delivered to the United States Navy. A subsequent order for 10 more airplanes of the same type has since been received. The S-43 is powered with Pratt & Whitney Hornet engines and equipped with Hamilton Standard Controllable propellers.

Left to Right: The 3-place Argonaut "Pirate" powered with the 125 h.p. Menasco C-4 engine opens a new field of amphibions for the private owner. One of the first of small commercial airplanes for the private market was the Ryan S-T which made its debut over two years ago. This popular two place job came into added laurels when Tex Rankin (in cockpit) won first place in the aerobatic competition at St. Louis May 28-31. The "Ben Jones" (extreme right), utilizing the Menasco C4S supercharged engine has a rated speed of 150 miles an hour. This new ship is in production at Schenectady, New York.

The In-Line In Demand

A review of the many new designs powered with Menasco in-line engines since the advent of the Ryan S-T.

FRED L. HATTOOM

THERE is little romance connected with the business of manufacturing aircraft engines. This, in most part, can be considered cause for the little published regarding power plants. A few changes, a new model, or the development of a new type power plant plant affords the scope of news value connected with aircraft engines.

From more than 100 firms engaged in the manufacturing of aircraft engines eight years ago, this number has reduced itself through the process of elimination to about one-tenth of the number of engine builders on record in 1929. Today, those in the aircraft engine field are here to stay if they can keep pace with the trends of the industry. These remaining engine companies are established firmly and already have a definite market for their engines which makes it possible for them to continue under the heavy burden of initial investment and operating expense.

Among the early companies engaged in engine manufacturing and one which has kept abreast with the needs for a definite type of power plant is the Menasco Manufacturing Company of Los Angeles. From a far-sighted idea, generated by the aggressiveness of A. S. Menasco, engines of this company have become known the world over as distinctive engines in the lower power field.

Today, Menasco manufactures in regular production five approved models ranging from 95 to 200 h.p. In addition, testing and development work is being done constantly on models of higher power.

Certain advantages characteristic of the inverted, inline, and air-cooled engine such as were pioneered and developed by the Menasco Company make them especially adaptable for the commercial plane and have resulted in these engines being used the world over.

The design of commercial planes is highly competitive. The utmost performance per h.p. is demanded to make the planes salable in the present market. In accomplishing this performance Menasco engines are supplying many plane builders' need for perfect streamlining, high center of thrust, low center of gravity, unobstructed vision, and an engine that lends itself to the present type of fuselage design.

ONE of the first of these new commercial planes to make its presence felt on the market is the Ryan ST. This metal plane was introduced at a time when others were giving thought to the design of a new commercial plane of its approximate size. The performance of the Ryan caused some of the drawing board plans to be reworked in an attempt to achieve a comparable performance with this neat little sport plane.

It was an advanced design to anything in its class. Its fuselage was narrow and its nose void of any protruding cylinders. Fully loaded, this plane clipped 150 m.p.h. to the delight of its owner and to the surprise of spectators. It was a new era in small commercial airplane history.

Since the introduction of the Ryan ST about two years ago, the picture of the small commercial airplane for private ownership has been broadened. Since then the acceptance of the in-line engine has been more than favorable.

The same engine characteristics that were responsible greatly for the Ryan performance caught on with others entering the commercial plane field.

In Tonawanda, New York, the Argonaut Aircraft Company sensed a definite market for a small amphibian that would give the right performance to the aviation enthusiast living near the water front. A Menasco C4 engine developing 125 h.p. was installed in pusher style in a nacelle above the hull. This installation streamlined to the consistency of the ship design gave the Argonaut 100 m.p.h., placing this ship in the useful class for the private owner. With a cruising range of 275 miles and a service ceiling of 10,500 feet, this plane is expected to be a popular choice among sportsmen wanting both the land and water flying features combined.

Another of the new designed commercial planes making excellent headway is the Stearman-Hammond Model "Y," manufactured in San Francisco. Some may be dubious about this design but that can be attributed solely to the unimpressive, so-called unorthodox appearance of the Model "Y" which is lost in admiration once the flying qualities of this plane are known.

The Model "Y" comes more nearly answering the description of the "fool-proof" plane since this angle was a dominating influence in its designing and engineering. However, airplane performance was not sacrificed in including the characteristics that would prevent this plane from stalling, spinning, ground looping, or bouncing. In addition to having such refinements as a sound proofed cabin, which also is heated and ventilated, the Model "Y" provides comfort for its two occupants and a cruis-

The Stearman-Hammond Model Y, developed originally in the Bureau of Air Commerce light plane competition of which it was the winner, is now in commercial production for the private market. The "Y" features regular airplane performance with characteristics that prevent the plane from stalling, spinning, ground looping or bouncing. It is powered with a Menasco C4 engine in pusher installation.

ing range of 500 miles. Powered with a Menasco C4 engine in pusher installation, the Model "Y" does an excellent job of living up to its modern plane performance.

REARWIN, one of the best selling airplanes in its price class, soon will feature its new Speedster, Model 6000M, also powered with a Menasco C4. It is predicted this finished little cabin job will have a maximum speed of more than 160 m.p.h. and a cruising range of 600 miles, according to specifications engineered by the Rearwin Company in designing its Menasco powered Speedster. This deluxe Speedster will be clean in cowl and attain new standards in Rearwin streamline.

Aeroneer, a new all-metal side-by-side cabin job which presented a handsome exhibit at the Second Annual Aircraft and Boat Show in Los Angeles, is nearing final tests before commercial marketing. This plane presented the side-by-side feature in one of the cleanest designs in the small plane field, having a cantilever wing blended into the excellent streamline of the design.

Complete in detail and workmanship, this plane will be introduced shortly, powered with the Menasco B4, C4, C4S, or B6 engines with a power range from 95 to 160 h.p. without any modification in engine cowl and fairing other than the replacing of the engine mount and engine controls. With the Menasco C4 engine, the Aeroneer is predicted to have a speed of 150 m.p.h., a service ceiling of 19,500 feet, and a rate of climb at sea level of 1,100 feet per minute.

Rugged in appearance, graceful of lines, and spacious in accommodations, the Ben Jones, starting production in Schenectady, New York, will make its conspicious appearance shortly. Powered by a Menasco C4 engine the Ben Jones will have a rated speed of 150 m.p.h. and powered with the super-charged C4S Menasco engine of 150 h.p. the Ben Jones is expected to do better than 160 m.p.h.

The name "Swallow" is one of the oldest in the history of American commercial airplanes. This company recently renewed production around a new model Swallow powered with a Menasco C4 engine. The first of this new production series was exhibited at the Los Angeles Aircraft and Boat Show and created more than favorable impression with exhibitors as well as with the aviation conscious spectators.

The new Swallow indicates performance which will surpass some other makes of similar design and more power. This company plans to extend its operation later this year to include larger models powered with the Menasco B6 engine of 160 h.p.

WHILE these are a few of the established designs which out perform by a wide margin the commercial planes of two years ago, superior models are being contemplated by these manufacturers and by others making preparation for near future production.

One of the first considerations in the designing of aircraft is that given to the type engine to be used. Each designer reaches for new heights and standards in performance, design, and construction. The type power plant to be used has more than a minor effect in the ultimate result with the upshot being negotiation with the engine manufacturer while the proposed plane still is only a mental consideration. Probably no other barometer is more reliable as to the coming year's airplane production and designs than the engine companies.

Inquiries regarding engines are substantial and reliable in that this information is of little use to the public

(Continued on Page 34)

One of the newest all-metal sport planes is the two-place Aeroneer which may be powered with any of the four Menascos offering a range from 95 to 160 h.p. This exceptionally clean ship is now undergoing ATC tests in Los Angeles.

Tex-air-tour

Summer doesn't officially open in Texas until the Dallas promoters get up a tour and sweep through a large sector of the Longhorn State, preferably with stops on the Mexican border.

LARRY J. FISHER

"COME, my faithful followers!" said "Buck," and from a thousand throats (or maybe it was fifty) rose the cry, "Buck Rowe Rides Again!"

And another Texas Air Tour was underway with the old Blue-Ribbon Tour Maestro leading the way and Bob Glass, Starter, bringing up the rear (on the take-offs). Mrs. Glass and Mrs. Harry Sellers got themselves the job of official Wave Good-byers as Bob gave a farewell salute to our hosts at each stop.

Our hosts were all that the title implied at every town on the itinerary. They even had a brass band out to meet us at Abilene and big crowds greeted the visitors at every port.

Even the weatherman was nice to us. Dallas offered a rain storm the night before the take-off but clear sunshine greeted us the morning of May 13. The fact that 13 airplanes took off on that ominous day of the month seemed to bother no one. Who said pilots are superstitious? Anyhow, we added more planes at each stop and there were 22 of them by the finish.

Abilene, the first stop, was reached on schedule as were all the others—a compliment, indeed, to those in charge. Here the world-famous Hardin-Simmons cowboy band, assisted by Charlie Short with baton and trumpet, entertained. Mayor Hair and other officials extended the city's greetings at the splendid airport managed by the great Derryberry.

In less than half an hour, the tour was landing in Sweetwater. The runways, being constructed under WPA, were in fine shape and the Sweetwater Service Club rushed us to town for an excellent luncheon. Mayor Watson gave us the keys to the city, and it appeared to be a lively little city at that.

Speaking of city keys, Andy Anderson didn't need one—he brought his own along, a huge key strung around his neck with a bright red ribbon. Said Andy, "If the key doesn't open it, I knock with the key"—the illustration of the last phrase was deafening!

San Angelo was the only so-so stop along the way. We only stayed an hour and were soon headed across mile after mile of nothing but mesquite—Texas' great open spaces; even the railroad gave up at Sonora. Pilots with two-way radio amused themselves along the way with conversation between the ships.

Before long, though, we saw the silvery Rio Grande and headed for Dr. Brinkley's domain, Del Rio. Good arrangements had been made for staking the ships out and waiting cars carried us to the hotel and our first overnight border stop.

With customs officers as our guides, Ma Crosby's cafe in Villa Acuna provided a dinner and dance; here, in Old Mexico, began the souvenir-collecting mania. By the time we had made three border visits, the ships were hardly able to stagger off the ground under their load of mementos. The prize goes to R. B. Cowden, Midland, who acquired a huge red Mex hat wider than his Rearwin.

Next morning, with the Rio Grande as our airway marker, the armada headed downstream for the luncheon stop at Eagle Pass, where the local chamber of commerce and the Piedras Negras outfit acted as hosts and provided one of the best meals and the finest entertainment on the tour. A typical floor show, Mexican hat dance and all, was especially given for us. At this luncheon, let it be recorded, came the best crack of the air tour: one of our unacquainted-with-airplane welcomers noted, that when the ships arrived there were "thirteen mail planes and four Beechcraft."

Again a hundred miles of nothing, following departures from Eagle Pass but the gang was looking forward to the night at Laredo. They weren't disappointed for young Lule N. Perkins, acting manager for the Laredo Chamber of Commerce, saw to it that the guests were well entertained in Nuevo Laredo. An inspection of one of the world's largest hat factories preceded the take-off next morning.

OUR route led away from the Rio Grande and the air caravan cut across the southern tip of Texas to Corpus Christi. Most of the visitors reached the bay city before noon and found the airport gaily decorated with pennants in their honor. The welcom-

CANDID!

(Photos by Joe Shumate, Paul Moomaw and the author)

1. The only time the group stood still long enough for a mass shot—Laredo Airport. 2. Buck Rowe Rides Again! 3. Charlie Short with Simmons' College Cowboy Band in Abilene, showing how it's done with a trumpet and beard. 4. The Del Rio airport from on high. 5. Line-up of the six Stinson on the tour. 6. Andy Anderson of Dallas with his key to all the cities. 7. Left to Right: Jimmie Kolp, Mrs. R. Z. Glass, Mrs. Ronnie More, Gerry Honomichl, Mrs. Bub Merrill and Blanche Noyes, on the Plaza "Deck" in Corpus Christi. 8. Three huge busses and private

ing committee, among who were Eddie Johnson, Dale Miller, Dick Furman and several charming ladies, did the honors by pinning on N. A. A. badges. This was the first stop as guests of a local N. A. A. chapter.

Lured by the salt air, we spent most of the day fishing and boating. We reassembled at the Plaza in the evening and were guests at an open house given by the Humble Oil Company. Later, a special dinner and dance was given on the "Deck" atop the hotel and mayor protem, Joe Mireur, gave the most startling greeting speech of the tour. He said, in part:

"I'd like to welcome you but I ought to give you hell. You're all about half shot—as am I." Of course, that was all in fun for who ever heard of air tour members being lubricated!

Galveston was taking no chance on our doubting their promised reception. Otto Carlson and Dr. W. E. Huddleston flew down to Corpus to extend an advance welcome. The latter had come in from Taos, New Mexico, especially for the occasion.

Busses met the plane at the Island City next day and conveyed the visitors to the Galvez for luncheon. Various officials made speeches, the substance of which was that Galveston should be made an overnight stop next trip in order that the town could really be appreciated. Thanks to Bob Scholes.

After a short hop, the gang landed at the final tour stop, Houston. (The Austin visit had been cancelled at the beginning of the tour.) With a special police escort, the party was conveyed to the "1776" ranch as guests of Raymond Pearson. The quiet atmosphere of the country place was appreciated—to say nothing of the barbecue and the refreshments. The aviation committee of the Houston Chamber of Commerce strutted their stuff and the hospitality served as a fitting climax to the trip.

Towards evening, the group returned to Houston as guests of Charlie Neuhaus and Heywood Nelms, representing the Houston Airport Corporation, at the Texas State Hotel.

I regret that space does not permit listing the committees at the various stops; they all did nobly at their jobs and will certainly be remembered by the members of the tour.

The flight covered almost 1200 miles and was made without mishap or trouble of any kind. Speaking of routes, Humble carried out C. C. Scott and Jack Schweizer's idea; the result—a neat package containing a marked map, scratch paper, weather reports—in short, everything needed for tour navigation, down to a clip to hold the map together. A thoughtful stunt, much appreciated.

In our afterthought department we remember: Blanche Noyes converting city officials to air marking; Mexican heartburn; candid cameramen; Helen R. Johnson N. A. Aying for part of the trip; the sensation the V-8 Arrow Sport created everywhere (it's Harry Hammill's newest prodigy); Charlie Short and his whiskers; gracious Jimmie Kolp with her white Spartan; wives (even Mrs. Barrow who had air-itis) really enjoying the trip; Stinsons hogging the tour from "the most of" standpoint; last mintue dash of Lee Miles to bring the rest of the *Southern Flight* staff to Corpus; the lady pilots posing prettily for a picture—after a three days' attempt on part of the cameraman; the kindness of Bob Glass, Dale Myers, C. C. Scott, Roy Harding and Doc Booth in hauling your hitch-hiking reporter and his baggage; the boys sweating under the Laredo sun, staking down their ships. And finally, pleasantest memory of all—one of the most congenial groups I've ever flown with. May we have many more tours like this one.

SHIPS AND PASSENGERS—*Texas Air Tour*

Pilot Ship Passengers

1. H. C. Barrow (Kinner), Mrs. Barrow.
2. Mrs. Jimmie Kolp (Spartan).
3. Joe Shumate (Beechcraft), Cliff Pettit, Alex Hudson, "Red" Noakes.
4. Rorie Cowden (Waco F), Paul Blackwell.
5. Ralph Lockwood (Stinson), Miss Guilbeau, Bess Wright, Geo. Mixon.
6. Buck Rowe (Stinson), Charlie Short, Johnnie Williams.
7. Ed. F. Booth (Stinson), Frank Say.
8. Roy Harding (Stinson), Gerry Honomichl.
9. C. C. Scott (Stinson), R. M. Stevens.
10. "Bub" Merrill (Waco), Mrs. Merrill.
11. Blanche Noyes (Monocoupe).
12. R. Z. Glass (Beechcraft), Mrs. Glass, Mr. and Mrs. Harry Sellers, Larry Fisher.
13. M. F. Clark (Kinner).
14. Andy Anderson (Fairchild), Mrs. Anderson.
15. J. D. Reed (Fairchild), Mrs. Reed, J. M. Ferguson, Mrs. C. C. Scott.
16. R. B. Cowden (Rearwin).
17. Harry Hammill (Beechcraft), Mrs. Hammill.
18. Dale Myers (Arrow Sport).
19. Bob LeSage (Beechcraft), Mrs. LeSage and Mr. and Mrs. J. H. LeSage.
20. J. B. Nehls (Stinson), Mrs. Nehls, Ross Iliff.
21. Lee Miles (Cessna), George Haddaway, A. T. Barrett, Park Weaver.
22. Otto Carlson (Fairchild), Dr. W. E. Huddleston.

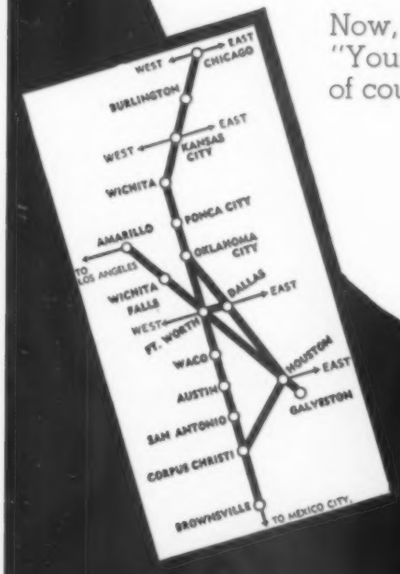
autos carried the gang to the Galvez for Sunday dinner in Galveston—note the hunger on faces. 9. The air tour floor show at the Eagle Pass-Piedras Negras party, one of the outstanding entertainments of this year's cruise. 10. BAC Inspector Mac Clark bargains for cigarettes across the border—we know where he gets the name "Mac." 11. International bridge at Eagle Pass and the lazy Rio Grande, nature's only compass to Laredo. 12. Roy Hofheinz, Harris County judge, puts his signature on the official air tour hat at the Pearson 1776 Ranch party near Houston. 13. The flags were flying at Corpus Christi, where the N. A. A. chapter were hosts to the airtourists.

..BRANIFF
SPREADS NEW
Douglas Wings
OVER THE SOUTHWEST

Keeping pace with the swift increase in the popularity of its friendly transportation through Mid-America, Braniff has supplemented its fleet of speedy, smooth-flying Electra Lockheeds with a new fleet of sumptuous 14-passsnger Douglas transports which will be put into operation in Mid-June.

This new fleet of DC-2's increases Braniff's passenger capacity 140%, and has been made necessary by the popularity of the Braniff Airways and its friendly transportation . . . a popularity that upped Braniff passenger traffic 154% during 1936 and has built Braniff from Vegas to Douglases in less than two years!

Now, more than ever, is it true that, "Your best travel **buy** is by Braniff, of course!"



BRANIFF AIRWAYS
GREAT LAKES TO THE GULF

FRIENDLY TRANSPORTATION FROM
THE GREAT LAKES TO THE GULF

..BRANIFF

SETS A NEW STYLE IN *Air Hostesses*

Setting a new style in air hostesses, Braniff Airways gives point and color to its international connections by requiring all its hostesses to speak Spanish and has garbed them most fetchingly in modified Mexican uniforms. Braniff's own color scheme of silver and red has been carried out in these new uniforms with their silver grey boleros, skirts and shoes, red halo hats and sashes. This departure from the orthodox in the styling, training and prerequisites of its air hostesses is in complete harmony with Braniff's policy to provide its passengers with an individualistic and personal service of the highest type, as well as with efficient, reliable, fast, comfortable transportation.

For reservations and information, call any Braniff office, travel agent or telegraph office.

BRANIFF AIRWAYS
GREAT LAKES TO THE GULF

FRIENDLY TRANSPORTATION FROM THE GREAT LAKES TO THE GULF

News of the Month in Review

The Manufacturers

The value of aeronautical sales in the U. S. during the first four months of this year show an increase of 61.4% over the same period of last year. Aircraft, engines and spare parts totaled $30,474,871 as compared to $18,878,805. April sales totaled $8,908,805. 149 commercial planes and 51 military craft were delivered during the month.

LOCKHEED AIRCRAFT CORPORATION moved into its new factory recently and has stepped up production to care for the booked orders of ten transports per month. Test flights for the new Super-Electra, Model 14, are expected to take place late in June. The first eight of the new 14's will be delivered to Northwest Airlines. The 100th Electra was delivered recently, going to Polish Airlines of Warsaw, Poland. It is the second time in history of American airplane manufacture that any company has completed a hundred units of a particular type of bi-motored transport.

The DOUGLAS AIRCRAFT COMPANY has launched the fourth of a fleet of 32-passenger DF flying boats. Two of these craft have been sold to Soviet Russia. Work is progressing steadily on the DC-4, four-engined transport destined for domestic operators.

The Amtorg Trading Corporation, on behalf of the Soviet government, has signed a contract involving $780,000 with the SEVERSKY AIRCRAFT CORPORATION. It is comprised of an order for two amphibians and manufacturing rights on these airplanes. A working agreement also is included, covering a period of three years during which time Seversky will assist the Russian government to produce these airplanes in Russia on a large scale.

A new band pass filter, devised by WESTERN ELECTRIC, enables a pilot to listen exclusively to either the radio beacon signal or weather reports which are put on the air simultaneously by the D of C stations. It operates by filtering out the frequencies of either the beacon or weather report, permitting only one to enter the receiver.

Sales of Beechcraft airplanes and parts during the first four months of 1937 exceed the total sales of 1936 according to a recent statement made by Walter H. Beech, president of the BEECH AIRCRAFT CORPORATION. Sales for the four month period totaled $278,884 and compare with sales of $180,074 for the first four months of 1936. Orders on hand April 30 totaled $286,050 which combined with actual sales amount to $564,934. For all of 1936 sales totaled $559,053. Under the leadership of John P. Gaty, Sales Manager, orders for over $110,000 were booked the first 20 days in May. Gaty is pushing an extensive sales campaign which extends over all countries in the world where airplanes can be sold. The factory is pushing production along even more rapidly with increases in personnel and a great deal of new machinery and equipment. Construction on the new Model 18 bi-motor airplane is being pushed along to meet increasing orders and inquiries on the ship are said to be coming from many foreign countries. Common stock of the Beech Corporation was admitted to the New York curb exchange on May 3 for trading and the number of shares now total $239,041.

LYCOMING division of the Aviation Manufacturing Corporation announced recently that unfilled orders on hand for Lycoming engines and controllable propellers amounted to over $600,000. About half of these orders are for the army and navy. The Model P-220 Lycoming controllable with the new electric control and engine throttle integral is now available for Wright R-760-E1, E2 and ET engines as well as for all models of the Lycoming R-680 engine.

Sales of KINNER engines and parts for the first four months of this year amounted to $79,339, an increase of 80% over the same period of last year. Export business is extremely healthy. One of the new engine developments of the company, upwards of 800 horsepower, scheduled for delivery to the Navy is expected to be submitted to tests within the next month.

Selection of five graduates of leading colleges to receive the Piper Award of the TAYLOR AIRCRAFT COMPANY was completed recently. The five recipients will enter the Taylor factory during the summer as Cadets and will receive practical training in all branches of aircraft manufacture as well as flying instruction. A mass airplane flight of Cubs from Hornell, N. Y., to Bombay, India, will start sometime in July. The convoy will go cross-country to California, along the Pacific Coast to Alaska, across the Bering Strait down the East Coast of China and India to Bombay.

The VULTEE COMPANY now has more than $3,000,000 in unfilled orders for bombers scheduled for export. Negotiations by a foreign power for the purchase of a fleet of super-attack-bombers totalling $2,500,000 in cost has been confirmed by officials of the company.

UNITED AIRCRAFT CORPORATION has announced that the new 42 passenger Douglas DC-4 will be powered with four Pratt & Whitney engines of a new model, known as the Twin Hornet, capable of developing 1400 h. p. for take-off. It is a 14 cylinder, two-row radial with a displacement of 2180 cubic inches. Normal rating is 1130 h. p. at 2350 r. p. m., with 95 octane fuel. The engine has successfully completed dynamo-meter tests equivalent to the standard Army and Navy type test.

KOLLSMAN INSTRUMENT COMPANY has announced plans for removal of factory and offices from 1 Junius Street, Brooklyn, to Elmhurst, Long Island, sometime in August. The new factory will provide more than three times their present inadequate floor space.

MENASCO MANUFACTURING COMPANY announces receipt of an order for 25 engines from the STEARMAN-HAMMOND AIRCRAFT CORPORATION of San Francisco. The order calls for the supercharged four-cylinder engines of 150 h. p. and involves a sum of approximately $35,000. They will be installed in the new Stearman-Hammond production Model Y. O. J. Whitney of New York has been appointed Menasco parts and service representative. Personnel changes at the Menasco plant include the appointment of Walter Schindler as foreman of the machine shop and Latham Pollock as chief of the inspection department.

STEARMAN AIRCRAFT COMPANY, CESSNA AIRCRAFT COMPANY and the BEECH AIRCRAFT CORPORATION are cooperating in the establishment and operation of special aircraft vocational courses in the Wichita Public Schools. Courses are offered in welding, machine shop practice and sheet metal work. The companies are furnishing both material and machinery. Under the supervision of J. C. Woodlin, there are two training classes, one meeting from 7 to 10 p. m. on three nights a week while the other meets for eight hours on Saturdays. The courses were established to compensate for the serious shortage of trained men in the aircraft industry.

The BOEING AIRCRAFT COMPANY of Seattle announced decision of its Board of Directors June 1 to offer additional shares of capital stock to all stockholders of record at an offering price of $23 per share, the new stock to be offered at the rate of one share for every three shares now held.

The plan is subject to the approval of the Company's registration statement filed with the Securities and Exchange Commission at Washington, D. C., on May 18. The statement provides for the offer and sale of not more than 183,610 new shares plus 12,000 shares set aside for officers and employees of the company, which will be offered at the same price of $23 per share. Boeing officials announced that purchase warrants would be mailed June 12 to all stockholders of record at the close of business June 11, and that purchase rights would expire July 1. Holders of certificates for shares of common stock of United Aircraft & Transport Corporation who surrender such certificates for exchange, will be given the opportunity to subscribe to the new issue also.

The issue will be underwritten by a syndicate headed by Brown Harriman & Co., Incorporated, and G. M.-P. Murphy & Co., and including Blyth & Co., Inc., Lehman Bros., Hayden Stone & Co., Dean Witter & Co., and Ferris & Hardgrove.

Proceeds of the new stock issue will be used to provide additional working capital and funds for plant expansion, both necessitated by the large volume of business the company now has on hand and the exceptionally large unit size of the airplanes under production, Boeing officials said.

WALTER KIDDE & COMPANY have released a new booklet describing Lux carbon dioxide fire protection equipment. It is a sixteen page color brochure and is distributed free.

The LYON METAL PRODUCTS company has announced the appointment of Mr. H. B. Spackman as general sales manager. He will have supervision of all sales activity and will have associated with him a complete selling organization covering four major divisions of company activity.

Air Transport

The 20 scheduled air lines operating in the United States in April carried 76,199 passengers and flew 5,350,093 passenger miles, according to Bureau of Air Commerce figures. The lines carried 540,310 pounds of express.

TRANSCONTINENTAL & WESTERN AIR, INC., inaugurated "Skysleeper" service on June 1 when the new DC-3 and DST transports went into scheduled service over the system. The new ships are designed to accommodate eight persons in berths. Ultra-comfortable lounge chairs are provided for nine other travelers.

AMERICAN AIRLINES have launched a research and development program involving an expenditure of $150,000. A tri-motored Stinson will be used as the test "laboratory" for thorough testing of new developments as possible aids to air navigation as well as improvement of existing aids.

Wacos To Coast Guard

Three new Waco five-place cabin airplanes have been delivered recently to the United States Coast Guard. One was flown directly to the Air Station at Cape May, N. J., and the other two to the Air Patrol Detachment at El Paso, Texas. The one delivered to Cape May is equipped with skis in addition to its conventional wheel landing gear, indicating that it may later be used for northern patrol work. All three of the ships have been corrosion treated and prepared for use on Edo pontoons.

Powerplant Trends

(Continued from Page 12)

engine types may result, namely, the cylindrical or multi-row radial and the rectangular or flat multi-bank in-line. The form drag of these types need be no greater than for present-day powerplants, despite their decidedly greater output.

Contiued improvement in engine cooling has reduced the drag of both the air-and liquid-cooled systems and there appear to be still further opportunities of betterment. The combined reductions in powerplant drag may well result in cutting the fuel bill by as much as 10%, which if combined with a possible further improvement in specific consumption, gives hope of a net saving of 15 to 20%.

There is every reason to believe that our future engine, as well as airplane, development must continue to be a steady step-by-step process, keeping pace with our knowledge, rather than a sudden advance in much larger equipment. As in the past, each gain must be consolidated by thorough and painstaking tests before further progress is feasible both from an economic and an engineering standpoint. The problems confronting the designer are more complex than ever before and require both greater time and greater expense for their solutions. Fortunately, the aviation industry has passed through its pioneering days and is now equipped with personnel and experience to deal effectively with these problems. It may truly be said that aviation has at last settled into its stride. For this reason, I do not hesitate to affirm that powerplant development can and will keep pace with requirements.

In closing, I wish to express my gratitude to the various friends who have aided me with information and their counsel, and especially to members of our engineering staff who have been of such invaluable assistance. I also wish to draw attention to the debt of gratitude that commercial aviation in the United States owes to our Army Air Corps and Naval Air Service. Without their continued support and encouragement our technique would hardly have progressed to the point where such developments as I have outlined would be feasible.

IN THE AIR AND ON THE GROUND IT'S RCA ALL THE WAY!

SAFE IN THE DARKNESS

with RCA Aviation Radio Equipment to "Light" Your Way!

RCA equipment in three-fourths of America's Airports and most planes using them proves it's better!

Flashing through an inky sky, it's comforting to know that in spite of the darkness all about you, there *is* a light to guide you safely home —the "light" that's furnished by RCA Aviation Radio Apparatus.

RCA equipment in planes and airports means flying that's *safe!* That's why three-fourths of the airports in the United States — plus nearly all the planes using them— own RCA radio products. And this almost unanimous vote for RCA is proof that the equipment bearing the famous RCA trade-mark provides ace-high service.

Every day more and more pilots are equipping their planes with RCA Aviation Radio products. Are *you* enjoying the safety and convenience benefits of airplane radio that's RCA ALL THE WAY? You can—easily and inexpensively! Why not look into it? Just send us a card, and we'll forward information, without obligation, telling you about the complete RCA line of aviation radio products for planes and airports.

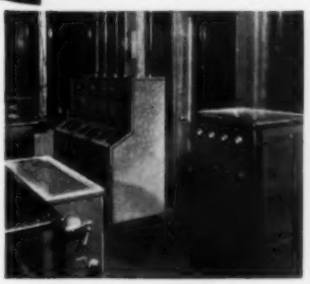
RCA presents the "Magic Key" every Sunday, 2 to 3 P. M., E. D. T., on NBC Blue Network

RCA for Aviation Radio

A SERVICE OF THE RADIO CORPORATION OF AMERICA

RCA Aviation Radio Instruments are sold by AIR ASSOCIATES, INC., Glendale, Cal; Chicago, Ill.; Garden City, L. I.; or write direct to Aviation Radio Section, RCA Mfg. Co., Inc., Camden, N. J.

"Right on the Nose!" After hours of flying in the darkness, the plane is brought in safely—its way "lighted" by the RCA equipment on board.



Allegheny Co. Airport, Pittsburgh, Pa., uses 5 RCA AVR-11 Airport receivers, each with an AVA-8 Crystal Control attachment. All are mounted in RCA MI-5747 Airport Traffic Control Tower Rack Cabinets. Also shown is RCA AVT-1A Airport Traffic Control Transmitter. Airport also has RCA AVT-1 Transmitter.

Ports of Call

Correspondence from the Airports and Airways

Atlanta, Georgia

By A. R. Seaman, Jr.

In the spring a young man's fancy turns to several things, among them, air tours. We Georgians believe that our tour of last September was tops, but on June 17th, we're going to top the tops. With 51 pilots participating in last year's tour, this won't be easy to do; but since then, many fine pilots have joined the ranks and a lot of the old ones who couldn't make it in September have been holding their breath for eight months awaiting the spring chance.

Alabama, Florida, North Carolina and Mississippi were some of the states represented in our grand three-day vacation. One more day has been added this year and should add immeasurably to the fun.

Local operations are on the up and up. We now have two tri-motors, a Ford and a Stinson, to accommodate sightseers along with our other ships. The Ford is flown by Joe Muslek, the Stinson by Pete Clay, who by the way, did a fine job flying the big ship in last year's air tour, carrying the public address system.

Chester Kitchings is now sporting a new 285 Wright Stinson, which is equipped with everything but the proverbial Kitchings stove. Ouch! Among the important accessories is a three-band Learadio. When its controllable prop is winding up and a good majority of the 285 hosses are straining at the bit, it really makes, as Max Smallwood, Hangar Attendant Par Excellence, would say, "notches"—Candler Field vernacular for knots.

A list of private pilots of importance who are flying, flitting and fluttering around the airport would exhaust not only my paper supply and memory but also my potential readers (loyal Atlantans, bless 'em). Anyway, just a few are W. J. Atkinson, Jr., Harry Balance, H. T. Cole, Dr. and Mrs. A. H. Frye, W. K. Jenkins, F. T. Peirce, George Potter, T. G. Smith, W. J. Stoddard, Frank Pierce and Harold Little. I guess that will make peace with any from 6 to 60 not mentioned because that which keeps hat from reposing on eyebrows struck a snag.

Among new ships for rental which should keep patrons is a new Autogiro, addition to the Blevins Aircraft fleet, and an 85 h.p. Aeronca low-wing in the Air Service stable. Pete Clay is particularly proud of the low-wing's performance and by its patronage, it must really be the berries.

L. G. Mason, besides running a first class mail order house for parts, etc., now has a nice pair of Fairchilds and several Cubs for rent. Some of the repair jobs turned out at his hangars should make most manufacturers jealous.

The new DC-3 Douglases put on by EAL are a sight to behold. Luxury in air travel has taken a leap forward by the advent of these super-ships. Advantage of air travel over all other modes is certainly exemplified in these fine craft.

Delta Air Lines has changed to a more convenient schedule for the summer months and are really carrying the passengers in the fleet of Lockheed "Electras." Improvement in the airport itself and purchase of additional land is now being contemplated, proving that in spite of its enivable position in aviation, those responsible for its development in Atlanta are not resting on their laurels but intend to keep improving and making it even more outstanding.

Brownsville, Texas

By G. G. Bevil

Reg Robbins of Fort Worth dropped in to visit with his many friends here on May 12th. He was in a new Howard which created quite some interest, being the first one to be seen at this airport.

Pilot Scott, flying the Humble Oil and Refining Company's Stinson, dropped in on the 15th.

Shell Petroleum Company's Waco was a visitor from Raymondville on the 23rd.

Pilot Jay Taylor, flying Halliburton Oil Company's Stinson from Tulsa, accompanied by Mr. John Halliburton and Mr. W. E. Clark, flew in on the 26th and proceeded to Mexico City the following day via Pan American Airways where they spent several days on business.

Pilot Francis Walton of Corpus Christi flying his Fleet paid us a visit on June 3rd.

Pilot R. S. LeSage of Dallas paid us another of his periodic visits in his Beechcraft on June 4th.

Pilot Walter Fullwood of McAllen has been in to see us several times this month in the interest of the BIG FOURTH OF JULY CELEBRATION to be held at McAllen. They are trying to get as many visiting ships as possible to attend the celebration. The writer can assure anyone flying to McAllen for this day a royal reception as the whole town is full of aviation enthusiasts.

Pilot Sam Penry of United Fruit Company's Central American Banana Dusting Fleet dropped in from Los Angeles on the fifth ferrying through his latest in Dusters, a Bach Tri-Motor Converted to a Single Cyclone Engine with sesqui-wings added. Plenty of power and lift for big loads of poison and slow enough to be very effective. Kind of made the writer homesick having spent several hours dodging trees, windmills, and highlines strafing the boll weevil.

The Pan American Airways employees and their families held an all day picnic and barbecue at Del Mar Beach on May 22nd. All proclaimed the event a large success. Plans are being made for a repeat order next year. There were about six hundred present; games, swimming, lounging, loafing, and dancing in the evening were the order of the day. We venture to say, from the looks of some next day, there will be more respect shown for Old Sol at the next picnic.

Cincinnati, Ohio

By A. F. Davis, Jr.

Some one ought to give Larry Fisher a great big hand for that flock of good pictures and the play-by-play account of "Louisiana Goes Touring"—Boy! that is my idea of a successful Air Tour . . . fly awhile and then eat . . . every third photograph shows the festive board and a lot of good food. Say, what was in that big platter, clam chowder, or fried chicken, southern style?

And that was a very fine picture of The Jimmie Wedell Monument. A fitting tribute to a great flier whose meteoric flash across the sky was all too brief.

There have been a few changes around Lunken Airport recently. American Airlines moved into the old Queen City Flying Service Hangar. Now you'll find Queen City in the first hangar down from the Administration Building . . . that is, if you can find the Administration Building . . . but no fooling, some day you visitors to the Queen City will find a strictly modern up-to-date air transport terminal. After all, Rome wasn't built in a day . . . not with PWA money, at any rate.

Roger E. Schlemmer, Chief Engineer at the Aeronautical Corporation of America, returned recently from Washington, D. C., where he attended the Twelfth Annual Conference of the National Advisory Committee for Aeronautics.

Just the other day Mr. Victor Gauvreau of the Govro-Nelson Company, aircraft engine specialist, was in the city.

The unparalleled enthusiasm for the new "K" model Aeronca has sent production far above the 1929 level. The production schedule for June is well over a hundred ships.

Recent additions to the Aeronca organization were Bill Stinson of Buffalo, New York, who has joined the Production Department, and Cliff Schoenfeld, formerly with Waco, who is now on the Aeronca Engineering Staff.

"Whitey" Rauner and Len Moore of Cincinnati took part in the St. Louis Air Race. Both are parachute jumpers. Frank Fairchild of the Cincinnati Automotive Trade School also attended the show.

Carl Friedlander and Dave Reif of the Aeronautical Corporation of America flew to Detroit on a business trip early in June. J. C. Welsch, Sales Manager, is in the East at present.

Clanton, Alabama

By J. Mell Martin

Dedication of Gragg Field has been officially set for July 3rd and 4th, 1937. The opening will be witnessed by thousands of people from this and adjoining states. This will be one of the best fields in the state aside from the larger cities. It is almost on a direct line and equal distance, between Montgomery and Birmingham and will give ample accommodations for most any ship.

A nice size hangar has just been completed and grading on the field will be finished by June 15th.

Invitations are being sent out for the occasion and ample committees have been appointed who will handle and accommodate the vast crowd that will attend the dedication.

GRAGG FIELD was given the name in honor of Dr. V. J. Gragg, one of the most enthusiastic aviators in this section and the first to own and operate a plane here. Much credit is due Dr. Gragg for his efforts in the completion of this beautiful and spacious Airport.

Fort Worth, Texas

By Camilla Ritchey

Dedication of Fort Worth's new terminal building will take place June 19th. A great many important personages in air transport, military aviation and the post office department have been invited to attend a banquet scheduled for the night of "Juneteenth." The airport will be thrown over to visitors during the day.

Reg Robbins, state distributor for Howard airplanes, reports a couple of sales and bright outlook for future sales. Reg attended the Birmingham Air Carnival early this month, flying Louis Yates and Carl Walrath of San Antonio over for the meet.

Ritchey Flying Service has purchased the Cessna C-34 belonging to Ungren and Frazier of Abilene, who have purchased a new C-37 model from state distributor Lee Miles. The latter individual has been absent from the city recently, doing some exhibition flying at middle-western air meets.

L. P. French reports a full house of repair business in his new shop. He is doing maintenance work on some of the outstanding privately owned ships in this territory.

We were all sorry to see Cliff Giblet's Waco cabin badly damaged during a landing recently on Meacham Field. The day was hot and gusty with an exceptionally high wind blowing from the south. Rocks on the runway didn't help the situation and the ship ground-looped with serious damage done to the wings, fuselage and landing gear.

Braniff and American have moved into the new Administration Building. The cigar counter is occupied and it is predicted the cafe will be moved in shortly. Pop Hotchkiss, also basing in the new building, is believed to have sold more airplanes since the first of the year than any other operator in this territory. His score is well above twenty so far.

Gainesville, Ga.

By F. H. Coune

The manager of the Gainesville Municipal Airport, Carl E. Stengel, operates a fleet of three Cubs and has instructed 160 students this year, with a solo record of 28 students. On Sunday, May 23, he conducted an air meet in cooperation with the WPA aviation ground school located here. The feature was a spot landing contest, won by James Shackleford with an average of 20 feet on three landings.

A large crowd attended the event. Stengel is a live operator and has demonstrated how to advance interest in aviation and the desire to fly.

The Aviation Ground School, under the direction of the correspondent, is meeting with excellent success. Courses are offered in every major phase of aeronautics.

Greensboro, N. C.

By William L. Beerman

A two-day program, May 28-29, officially dedicated the fine Greensboro-High Point airport. Climaxed by an airshow witnessed by many thousands, the events were ended by an Aviation Ball (brawl) at Sedgefield Manor.

Lieut.-Comm. Frank Hawks flew from Newark to be present, making the trip in his Beechcraft in two hours and 45 minutes. He was attired in a pair of shorts which he claimed were "English" in style. Dick Merrill and Jack Lambie, who were scheduled to attend along with Hawks, were unable to come down.

Over 400 persons attended the banquet at which the airport was officially turned over to the Guilford County commissioners. The principal address was made by Col. J. M. Johnson, assistant secretary of the department of commerce. Other notables attending were Gov. Clyde R. Hoey, Senator Robert R. Reynolds, Rear Admiral Arthur B. Cook, Harllee Branch, second assistant postmaster general, and many other Government, city, and county officials.

The airshow opened with a 'chute jump by Eddie Stinson, of Lakeland, Florida. Stinson also made a jump at the end of the program. A mass flight over High Point and Greensboro followed, all planes participating.

The winners of the events are as follows:

Light plane race, Ed Brockenborough.

Novelty race (they had to take their pants off), Hal Foster.

Ribbon cutting, Squeek Burnett.

Woman's handicap race, Mrs. Clayton Patterson.

Bomb dropping, winner: The safest place was the target itself.

Open plane race, Johnny Crowell in his Gee Bee.

Open biplane race, Allen Watkins.

Cabin plane race, 500 cubic inches of displacement, Douglas Creech.

Cabin plane race, 500 to 800 cubic inches of displacement, Reavis Nelson.

Grand finale race, Johnny Crowell.

Crowell gave a thrilling exhibition of aerobatics with his Warner powered Gee Bee, including an outside loop. Lewin McGinnis gave a

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demonstration on "how not to fly" in his Cub. Frank Hawks, who had taken over the announcing duties most of the afternoon, was persuaded to give up his witticisms and fly his Beechcraft in a speed dash as scheduled. Hawks, short pants and all, was clocked at 280 m. p. h.

Traffic, parking, and the huge crowd was handled by the state highway patrol, Guilford County's sheriff department, the police departments of Greensboro and High Point, and Boy Scouts from the two cities. Not a single mishap or accident marred the perfect, though blazing hot, day.

Prizes and awards were presented at the ball Saturday night. The pilots who were able flew home Sunday morning.

Hawks, who has flown over 1,250,000 miles and broken 214 speed records, stated definitely that he will abandon his new speed ship "Time Flies" and cease all attempts for records. This announcement was a complete surprise to all.

Since the dedication ceremonies Hawks has been through here twice in his Beechcraft, stopping overnight on Sunday, June 6, enroute to New York. Orville White, local golf pro, accompanied Hawks when he left Monday morning at 4:11 a. m. It is understood that White is going to Michigan to compete in the National Open Golf Tournament.

Kilgore, Texas

By Mrs. Roy Taylor

The College Flying Club has given Elder's Field the biggest boost in actual flying activity and general interest in aviation the field has had in quite some time. The Club is under the supervision of Roy Taylor, who recently purchased a Cub for instruction. The Club boasts 15 students and several have passed solo stage, namely, Jerry Sitton, Jack Peteron, J. L. Reynolds, M. D. Hendrix, Truman Hardy, Lester Scroggins and L. W. Holsapple.

The aircraft shop is busily engaged making a cotton duster of a Challenger Eaglerock belonging to D. N. McDonald of Greggton. Another Eaglerock belonging to Taylor Brothers is also being converted.

Ray Goodwin came back from Shreveport one day recently carrying a Transport License. Vernon Gower just received a private. Congratulations to both of them.

Recent visitors include J. B. Nehls, Mr. and Mrs. Van Stockton, Herb Hansen, Harry Hammill, Johnny Maxwell, Arthur Oakley, Garza Wooten and Lacy Taylor.

Russell Walters is the new owner of an OX Robin and Ray Goodwin has purchased the OX Commandaire from Glenn Blaylock. We understand the latter is to have a Hisso and hopper installed and that its owner will take it down south for dusting activities.

Clarence Thomas and Van Bryan are two new solo students. Jack Peterson and D. N. McDonald are busy nearly every day running up additional time in preparation for private pilot examinations.

Lafayette, Louisiana

By Horta Jones

The new all-steel hangar at our port is under construction, and will be completed within the next few months. Too bad it wasn't up to hangar the thirty some odd visiting ships here during the Louisiana air tour.

Yes, that was some air tour April 15 to 18! There were planes from Texas, Oklahoma, Arkansas, Mississippi, and, of course, Louisiana. There were little ones, medium ones, big one, and bigger one, among which were Lockheed, Aeroncas, Wacos, Fleets, Cubs, Army planes, Stinsons, Beechcrafts, Fairchilds, Birds, Eaglerocks and many other makes that your reporter can't remember. Among the distinguished guests were Joe Shumate, Dallas, Les, Martie, and Larnie Bowman, Texas, Buck Rowe, Dallas, Blanche Noyes, New Orleans and points east, Edna Gardner, New Orleans, Helen Johnson, Brownsville, Mr. and Mrs. Fritz Martin, Shreveport, Roy Harding, Dallas, Gerry Honomichl, Dallas, Reg Robins, U. S., Larry Fisher, Beaumont, Ed Travis, New Orleans, Louis Lenz, Lake Charles, Conway Allen, Shreveport, D. O. Langstaff, New Orleans, Andy Gibson and Captain T. B. Herndon (Army), Mansfield.

Speaking of the Louisiana tour, many hats should go off to Edna M. Gardner of New Orleans, who piloted her own plane on the tour without "flying instructor," "husband" or "boy friend" along to help her out. She holds a transport license and was the only one from New Orleans to make the complete tour. A real record and a real pilot.

As the visiting planes arrived, the pilots were propelled (very generously, of course) by Kellah Hutchison, local aviation enthusiast, to the registration table where they made their X's and then departed by auto to visit Les Jardins de Mouton. From there they were driven to the hotels where they "freshened up" for the evening entertainment, which consisted of a dinner dance at the Edgewater Club. The next morning the guests motored to Avery Island and visited the Jungle Gardens and the salt mine. This tour was topped by a luncheon served at Dudley Avery's picturesque home at the island. Everyone, apparently, had a scrumptious time. During the registration at the airport, the guests were welcomed in an address by our gallant mayor, J. Maxime Roy.

We are sorry to learn that Doc and Fanny's (Leonpacher) Bird had a major crackup a few weeks ago at Pecan Island. It is now being repaired by the Lafayette Flying Service, and should be in the air again in the next few days.

An added attraction (or distraction) to our airport since the first of the month is Charles "Frenchie" Fortun, formerly with Wedell-Williams, Patterson. Frenchie is in the employ of the Lafayette Flying Service in the capacity of office manager, and, I may add, is doing well for the cause.

Lt. Glynne Jones, airport manager, has returned from Candler Field, Ga., where he attended a two-weeks' flight camp at the Army Air Corps Headquarters there, under the direction of Major Patrick. Lt. Jones' criticisms were all quite favorable in regards to the camp and Army equipment used at Candler Field.

The N. A. A. is really "going to town"! Glynne Jones, state governor of the N. A. A., reports that several chapters are being rapidly formed in the State. Recent chapters are Shreveport with over 80 members, and Mansfield with approximately 60 members. New Orleans and Houma are under way and should be coming up for their charter soon.

Attending the Houma airport dedication from Lafayette were Fanny Leonpacher, Felix Foreman, Leo J. Gros, and Ronnie Briant.

Several would-be and wouldn't-be aviators and aviatrixes from here attended the meeting of the Evangeline Chapter of the N. A. A. held in Lake Charles, Thursday, May 27. They were Ruford Smith, Louis Broussard, Miss Rosina Singer, Mrs. Hazel Guilbeau, Ronnie Briant, Fanny Leonpacher, Mr. and Mrs. Malcolm Hart, Mr. and Mrs. Glynne Jones, and Mr. and Mrs. Leo J. Bulliard.

Department of Commerce Inspector, Lake Littlejohn, Shreveport, visited our airport recently and inspected several planes that came up for relicensing. Felix Foreman is working hard for his transport license, and I understand, will go up for the test in the next month.

Dude Camden is still flying in his Waco. Eddie Ross is flying a Beechcraft again. What happened to your Lockheed 12, Eddie? Malcolm Hart flew to Houston with Eddie the other day for a quick business trip. I was told he enjoyed it thoroughly.

Miami, Florida

By Karl E. Voelter

Time is not far back when June in Miami meant good weather but poor flying business. The past few years has seen a reversement, and this year certainly shows that June means no letup so far as flying activity is concerned.

The writer has delivered four airplanes within the past month, three new ones, and one very slightly used one—the latter being the fastest light plane ever clocked. It is an Aeronca, powered with an Aeronca engine, and is the same ship the writer flew to win the 200 cu. in. race at the last Miami All American Air Races. George Bunnell, Jr., local contractor and flying enthusiast, bought it and now spends about half of every day at the airport in his new prize.

Two of the new ships sold went to operators and one to a private owner.

The Miami medical association has certainly gone air minded. Between Doc's Martin and Pankey, physician and dentist respectively, who jointly own their own new Aeronca, they have instilled so much enthusiasm among the medicos and molar treaters that seldom a day goes by when one or more "Doc's" are not taking time or soloing in one of Voelter's airplanes, and added to the medical profession there

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is a good representation from the legal profession, and the net of it all is a revelation in the type students and solo pilots we are catering to. This seems to be true throughout aviation and of course among the high class operators—they all seem to be getting a high type student in today's student, and with that advent the aviation business will prosper and survive what so many of us have hoped for during so many by-gone years.

Interest this month is centered about the coming Florida State Air Tour, and from the reports we hear two weeks prior to its start there will be "swell doings" for all the boys—and girls. Our old pal, Pop Neilson, will wave the starting flag at Orlando (providing the boys can find their way to the airport after Orlando's party the night of June 21st) and on Tuesday morning the tour will officially start ENE out of Orlando and snake around through the State finally winding up in Miami on Saturday, June 26th, with a gala occasion and much frivolity. We hope to tell you the real facts in the next issue of *Southern Flight*.

"Al" Hansen has been named Director of Aviation for Miami by the new City Commission and has moved the office of Aviation Director from the City Hall to Municipal Airport where all aviation officials should be. Obviously, all who know "Al" could do no other than wish him well, and we know he'll do a swell job.

Among the pilots receiving flight tests and successfully passing them on this airport during the past month were John Hoffman and Bob Davis who got their transports, Bob Johnson, H. T. Kirkpatrick and George Cavaiani, each receiving a private, and besides those named several more had to leave for the North before Inspector Puckett could get to them. Among the latter was Jim Rainer who writes that he passed "with flying colors" at New York. And just before signing this we here in Miami invite you once more to—COME TO MIAMI.

St. Louis, Mo.

By Howard Barman

The aviation industry and competitive pilots looked back with favorable comment on the first International Aerobatic Competition and St. Louis Air Races staged on May 29, 30, and 31 at Lambert-St. Louis Airport in celebration of the tenth anniversary of the New York-Paris flight of Charles A. Lindbergh.

The three-day contests, directed by Jim Ewing, attracted as entrants outstanding pilots from the United States and abroad and plans already are under way for staging thet competitions as an annual affair.

In the aerobatic competition, first of international scope to be held in this country, the well-known "oldster," Tex Rankin shoved his stock model Ryan monoplane through intricate maneuvers in beautiful form to net 282.7 points for first place, the $2,000 cash award, and the International Aerobatic Competition trophy given the winner by the St. Louis Air Race Association, Inc., sponsors of the events. Capt. Alexandro de Papana, Roumanian aerobatic champion, brought the crowd to its feet several times as he flew his specially constructed German training plane in the competition. He won second place with 269.4 points and was given $1,000 in cash. P. Mantz was third; Capt. Len Povey, head of the Cuban air force, fourth; Lt. Joe Mackey of the Linco Aces was fifth and Mike Murphy, Kokomo, was sixth.

Two high spots marked the initial day's program which was opened officially by Hon. Bernard F. Dickmann, mayor of St. Louis. Spectators saw an amazing display of stick work when Roger Don Rae, 1936 racing champion, made a miraculous forced landing during the eighth lap of the 50 mile free-for-all in the 397 cubic inch class. Rae was in second place shooting around the course at an average speed of 252.8 miles per hour in his Folkerts ship. Suddenly the craft began to wobble. It almost went out of control. Then the propeller whirled earthward. The speeding racer careened crazily for a moment. Rae was dazed in the cockpit. But he regained control as the ship came even with the packed stands, lost speed and made a safe landing. While the ship was almost "washed out," Rae suffered only minor injuries. For that beautiful landing he won the John D. Brock sweepstakes trophy as the most outstanding pilot in the meet. Unfortunately, the mishap prevented Rae from participating further.

The second high spot of the day came when Mrs. Louise Thaden, 1936 Bendix winner and recipient of the Harmon trophy, raced her green Beechcraft over a 100 kilometer course to snatch the women's national commercial speed plane record from Earhart with an average of 197.9 m. p. h. Miss Earhart's record, made several years ago, was 174 m. p. h.

The race in which Rae was forced out was won by Art Chester, Los Angeles, who clipped off the 10 laps at 253.5 m. p. h., to net $900 first prize money. S. J. Wittman, Oshkosh, Wis., was second, gaining $500, and Jim Malone, St. Louis, placed third to take $300.

In the other race on the opening day, a 50 mile free-for-all for planes of 549 cubic inch displacement, Marion McKeen, Santa Monica, Cal., average 240 m. p. h. in his Menasco powered plane to take $900 first money. Gus J. Gotch, Los Angeles, took second money of $500 at 239.9 m. p. h. in a neck and neck finish. Chester was third with a $300 prize; Rudy Kling, Lemont, Ill., fourth, winning $200, and Wittman fifth with $100 in prize money.

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Between the races, all aerobatic competitors went up for preliminaries in the contest which carried a total of $5,000 cash prizes. In all, $15,500 cash prizes were awarded during the meet. The aerobatic contest was judged by Jimmy Doolittle of the Shell Petroleum Co., Philip R. Love, Billy Parker, aviation division of Phillips Petroleum Co., and John H. Livingston, Waterloo, Ia.

Gov. Lloyd C. Stark of Missouri headed a peak attendance of 40,000 persons on the second day. More than 80,000 attended during the three days.

On the second day, in addition to aerobatic contestants continuing with preliminaries, the Frank E. Phillips trophy race was staged for unlimited commercial planes around a 40 mile course. Art Chester won first with a speed of 192.2 miles per hour. Robert Glass, Dallas, Texas, was second; Jack Gaty, Wichita, Kan., third, and Marion McKeen, fourth. In addition to trophies, the pilots received $450, $250, $150, and $100.

Chester's second bid for honors on the second day card was blasted when he was forced out on the take-off in the 549 cubic inch 50 mile speed race which carried a purse of $2,500. Just as his ship left the ground, the motor quit. Investigation showed a broken crankcase. The event, and $1,125, was won by Rudy Kling at an average speed of 233.7 miles per hour. Marion McKeen was second, winning $625, and S. J. Wittman won $375 for third. A beautiful gold trophy was awarded the winner of this event by the Missouri Brewers' Association.

Several exhibitions were given during the programs. Among them were two bat wing jumps by Earl Stein of Findlay, O., a delayed drop by Faye Lucille Cox, the nation's No. 1 woman parachute jumper, smoke writing by Col. Art C. Goebel, the smoke writing Linco Aces made up of Lt. Loe Mackey, Edward S. Leach and Mike Murphy. The latter also took off his monoplane from the top of a speeding automobile and then performed a "crazy" flying act. Jim Malone of St. Louis did the "crazy" flying on the other two days.

M. C. Cox, Los Angeles, Whitey Rauer, Cincinnati, Leonard Moore, Norward, O., E. Verne Stewart, Elgin, Ill., and Mitchell Lakonski, Chicago, all widely known parachute jumpers, finished in the order named in the parachute target jumping contest. They received as prizes $146.25, $81.25, $48.75, $32.50, and $16.25, respectively. Massed parachute jumps also were staged.

The field during the events was in charge of T. H. (Doc) Kincade, who "retired" from officiating at competitive aviation events a year ago but was pressed back into service for the St. Louis contests. Bill Enyart of the N. A. A. contest committee also officiated.

Sarasota, Florida

By Dick Lindsay

The Aero Club of Sarasota, Inc., was formed in May and on the 17th placed an order for a 1937 model K high-wing Aeronca. At present there are 12 members. A goal of 20 charter members has been set and we hope to reach that mark before the ship is delivered, which should be sometime in June.

The Club is chartered as a non-profit corporation under the laws of the state of Florida. Operation will be along lines used by successful clubs in Florida and elsewhere. Members will fly at minimum rates.

One interesting feature is a "scholarship" in the Club given by the Sarasota Rotary Club to some local young man or woman, as a jesture of their interest in promoting the aviation development of the city. A full paid membership makes up the "scholarship."

The order was placed through the Beard Aircraft Company of St. Petersburg. Present officers of the Sarasota Aero Club are: Richard E. Lindsay, president; Taylor Green, secretary; and Clement Ferrell, treasurer.

San Antonio, Texas

By Greg Moore

There has been little activity at this field during the past month, but now that summer is here things are picking up a bit. Every Sunday, weather permitting, there are spot landing contests for the purpose of stimulating student flying. Eddie Smith and George Vordenbaum are fighting it out for permanent possession of the trophy. Both fly Aeroncas.

Tommy Gahan did a good piece of learning to fly the other day when he soloed a Taylor Cub in one hour and fifty minutes. The Cub belongs to Hangar Six which has used this type of ship for student instruction for a couple of years now with wonderful success. Hangar Six has ordered a new Stinson to add to its fleet of ships, and it is expected that the new ship will be delivered in the near future. Clint Thompson is now with this hangar as instructor. He was with Braniff in Corpus Christi for quite a while and then with Booth-Henning in Dallas. With student instruction increasing he will have plenty of flying to do. Hangar Six has a new Warner powered Rearwin and everybody who has flown it says that it is a great little job. P. H. Hebert is leaving this month for Bradford Pennsylvania to take delivery of a new Cub which he will fly back.

The new Model K Aeronca did not stay at the United Aero Hangar very long. It was sold the day after it was delivered, but not before several people had flown it. From all reports this is a neat little ship and should be very popular. The wheel control gives it the feel of a larger cabin job. United Aero hopes to have another one shortly. Clyde Stokes is now flying an Aeronca with Marlin Fischer of United.

Johnny Lott of Poteet dropped in the other day in his OX Robin for a short visit. O. M. Mosier, general manager of Braniff, was in on one of his regular inspection trips. Braniff has started serving lunch to passengers on the north bound ship. This meal is served shortly after the ship leaves the field about supper time.

Dick Hair has been making several trips in his Waco this past month. He and his wife and son flew to Corpus Christi the other day just for fun. He is very enthusiastic over the Waco, of which he is local dealer.

Hangar space at Stinson is getting very scarce, due to the tearing down of one of the hangars. It looks as though a new storage hangar is very much needed and will have to be built very soon. Flying is picking up all around.

San Antonio Chapter, National Aeronautic Association, will elect a new treasurer at its next meeting the second Monday in June. Miss Merle McCracken, chapter treasurer, has moved to Hampton Roads, Va.

Stuart Harris of the engineering department of Southern Prison Company, soloed an Aeronca of United Aero Corporation. He has been taking instruction under Marlin Fischer and Al Tuerpe.

The Fairchild photographic ship of Kargl Aerial Surveys, which has been hangared at Modern Air Travel, left for Pensacola, Fla., where it will base for a while. Carl Hughes was the pilot.

Savannah, Georgia

By Lydia Muse

Savannah enjoyed Airport Day, being the official dedication of the Atlantic and Gulf Coast Airline, and several thousand people attended the ceremony. Mrs. H. G. Strachan, Jr., christened the new airliner "Miss Savannah." The following prominent officials were in attendance: Mayor Hitch, of Savannah; Andrew Smith, general manager of the Savannah Hotel; Mr. Fred Lanter, of the Department of Commerce; Mr. Dan Green, Wing Commander of the Junior Birdmen of the Georgian American, Atlanta, Ga.; John E. Hodge, president of the Savannah Chapter of the N. A. A. Mr. Hodge made a very interesting talk and presented Mayor Hitch, and H. G. Strachan, Jr., with charter memberships to the N. A. A. Mrs. Dick Bennett and Miss Lydia Muse presented the beautiful basket of flowers to Mr. H. G. Strachan, Jr., president of the Atlantic and Gulf Airline. Several guests were given complimentary rides in the newly christened airliner.

Strachan Skyways reports their newly completely overhauled and refinished Great Lakes is now in operation, the following students being soloed during the last thirty days: Mr. Perry Solomon, Mr. George Schumenan, Mr. Thomas Dooley.

Lt. Hugh DuBois of the Army Reserve Base, Atlanta, Ga., flew in an army A3 observation plane and spent the day in discussion of the airliner and commercial operation with H. G. Strachan, Jr., and Owen MacRoberts.

Lt. Robert Travis paid his respects Airport Day by flying over the city, and circling the airport.

Mr. Chas. Wonycott, operations manager of the Atlantic and Gulf Coast Airline, had the misfortune and same experience of the former Prince of Wales of falling off his horse and more or less incapacitating him for a couple of days. We of course realize, it being coronation week, that the fall was in line and very appropriate for that particular occasion.

The following pilots are anticipating attending the Georgia tour: Lydia Muse, Roy Workman, W. W. Gordon, Owen MacRoberts, H. G. Strachan, Jr., Hammond Eve, Jr., John E. Hodge.

At Savannah Beach, an air show was held Sunday, June 6th. H. G. Strachan, Jr., president of the Atlantic Gulf Coast Airline, performed the stunt flying, and thrilled spectators, when in the Great Lakes, picked up a flag off the beach with the wing of the ship. Geo. Cowan, well known automobile stunt man, rolled over a Plymouth sedan. Bob Robertson made a parachute jump from the Cub piloted by Owen MacRoberts. He landed approximately 500 feet from the beach, and was picked up by a seaplane piloted by J. Heron.

Dr. Jno. E. Hodge and Owen MacRoberts flew to the Greensboro Airmeet—and returned feeling it was a wonderful success. They invited several of the Carolina Aero Club members to visit Savannah on the Georgia Air Tour.

Mr. James Craft of Birmingham, Ala., flying a Monocoupe, landed and staved a day and night.

Mr. James Wheeler of the Shell Oil Co. was a visitor to the airport for several days. Owen MacRoberts accompanied him to Jacksonville. Mr. Ralph Lockwood of the Gulf Oil Co., Atlanta, was a recent visitor. Lt. Com. Calloway from Anacostia, D. C., flew in a Grumman and staved several days. Mr. Bob Bryant was a visitor here for ten days during his late mother's illness.

Three Strachan Flight School airplanes visited the naval base at Parris Island, S. C., through an invitation of Col. Dyer. Those making the trip: Lydia Muse, Roy Workman, Ed Jungeman, W. W. Gor-

don, Owen MacRoberts, and Geo. Schumenan.

Young Savannah aviation enthusiasts spending many hours working over models, plans and testing in flight their labors at Savannah Airport find that Chief Instructor Owen MacRoberts gives full cooperation and lends all possible aid. Thomas Roesel, chairman of the Savannah Gas Model Club, stated they expect to enter in the Southeastern State Contest in Jacksonville in August and anticipated bringing home victories.

Your correspondent received her private license on May 26th, Lt. James Nall, of the Department of Commerce, giving examination.

Shreveport, Louisiana

By Jack E. Myers

MUNICIPAL AIRPORT

Effective on May 17th, the Delta Air Lines inaugurated service which makes possible overnight trips to New York with connections at Atlanta with the Eastern Air Lines. Leaving here at 7:18 p. m. a person can be in New York the following morning at 6:50 a. m. Or, if a passenger desires, he can make connections at Miami with the Pan American Airways clipper planes and arrive in Havana at 10:45 a. m., Colombia at 5:15 p. m., and San Juan, Puerto Rico at 6 p. m. the day after departing from Shreveport.

A Shreveport flyer, John Van Buren, left early in May for Atlanta, Ga., where he has been offered a position there as co-pilot for the Delta Air Lines. This line runs from Dallas, Texas, to Charleston, S. C., and incidently passes through this city.

The longest passage ever booked from Shreveport by air was made when Mrs. Charles P. Schultz of this city boarded a plane of the Delta Air Lines at noon on Friday, May 14th. She arrived in Maracaibo, Venezuela the following Sunday morning.

Amos 'n' Andy, the famed radio artists, were visitors here on May 15th. After spending the afternoon looking over one of the nearby oil fields, they left in one of the Delta Air Lines' planes for Hollywood, California, by way of Dallas and Fort Worth.

BARKSDALE FIELD

Home of the Third Attack Wing

On Friday, May 7th, the first army autogiro to visit Barksdale Field landed here, attracting attention by requiring only a few feet of rolling before coming to a stop. After an overnight stay it departed for Ft. Riley, Kansas. Lieut. L. Nichols was its pilot.

Brig. Gen. Frederick L. Martin, commanding general, left this month for the Army and Navy hospital at Little Rock, Ark., where he is undergoing examination and observation. He expects to be back some time in the latter part of June.

First Lieut. Frank A. Armstrong has been awarded the flying cross for heroism displayed in the jungle regions of the Panama Canal zone. While 4,000 feet over mountainous jungles, he ordered three passengers to jump to safety with their parachutes, because of the disintegrating of one of the motors of his army plane. With the lightened load, he then made a safe landing. This occurred on November 20th, 1935.

Lieut. Col. William C. Ocker, aviation pioneer, stationed at Brooks Fietld, Texas, has been ordered transferred to this field in the near future. Col. Ocker is the army's oldest pilot in point of continuous service, having learned flying by the Wright brothers back in 1908. He took an active part in bringing about the development of blind flying.

Thirty-three planes, consisting of 20 pursuits, 9 attacks, and 4 bombers from Kelly Field landed here on May 20th. They were carrying cadets of the air corps flying school on an aviation flight.

The first new type Northrop attack plane, of the 56 which this field is to receive, arrived on May 19th. It was flown here from California by Maj. Louis C. Webster. Up to the present time (June 10th) they have been coming in at the rate of about three each week. These planes are almost similar to those already in use here; the principal difference being that the new ones have retractable landing gears, which give greater speeds.

The planes of the Third Attack Group and 55th Pursuit Squadron, mentioned in last month's publication, have returned from the California coast where they participated in the most elaborate war maneuvers ever staged by the GHQ air force. The maneuvers were directed by Maj. Gen. Frank M. Andrews, GHQ commander, and Brig. Gen. Gerald C. Brant, second in command and commanding general of the second wing. While en route from these maneuvers, Brig. Gen. Brant, former commanding general of Barksdale, visited here. While here he disclosed plans for the unveiling of a life-size oil portrait of the late Lieut. Eugene Hoye Barksdale, for whom the local post is named. This will probably be held in the latter part of June. Gen. Brant said that he was interested in conducting joint maneuvers in the Shreveport area between the Second Wing and the Third Wing.

On May 19th, two of the B-17, four engined bombers were here, using this field for practice training. They were flown here from Langley Field, Va. Barksdale's landing area offers more room than the Virginia field.

Incidently, one of these bombers narrowly averted disaster on the night of May 25th, when a skilled crew flew it here from Atlanta, Ga. Major V. J. Meloy, chief pilot of the hugh "flying fortress," said that the plane's intricate electrical system went dead, leaving the crew in total darkness and making useless the numerous instruments by which the plane is flown. They could not use the radio for an SOS. Neither could they receive the airline beam. Even the wing lights would not burn. They nursed the plane to this field, only to find that the floodlight units were idle and the ground crew could not be roused. Because of the crippled electric system, the plane's wing flaps refused to work. They made a swift and hazardous, but a safe landing at 4 a. m.

Tampa, Florida

By R. E. Burritt

Aviation leaders from all parts of the state attending the annual membership meeting of the Tampa chapter of the National Aeronautic Association at the Davis Islands Country club May 15th paid tribute to Florida's aviation development in recent years and predicted even greater progress for the future.

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A letter from Col. Peter O. Knight was read by Mayor Chancey in which he said Tampa is one of the greatest natural air centers in the country and destined to be one of the most popular locations for private flyers as well as commercial airlines.

"Tampa got its start as an air center thousands of years ago," the letter said, "by being situated on a landlocked bay and being strategically located on a great continent with easy access to that continent's best customer.

"Added to that was an ideal climate which has made possible the operation of commercial airlines within the state without a single accident. We now have a well-planned program of development looking toward the future which will claim increasing attention for us as a national aviation center."

Colonel Knight's letter pointed out the world's first commercial airline was started between St. Petersburg and Tampa in 1914 and that plans now are being made by the National Airlines association for appropriate ceremonies here in 1939 to commemorate the event.

Postmaster Wall, chairman of the board of directors of the Tampa N. A. A. chapter, presided at the meeting and presented certificates of merit to Sidney C. Brown, president, and J. A. Waterman, chairman of the aviation committee of the chamber of commerce, on behalf of the national association for their "outstanding service" in promoting interest in aviation.

In addition to Mr. Brown, officers installed at the meeting were Mr. Waterman, first vice-president; Carl D. Brorein, second vice-president; R. G. Jones, third vice-president; Leslie H. Blank, executive secretary; W. F. Ives, treasurer; and R. E. Burritt, chairman of the executive committee.

Maj. Fred L. Smith of Washington, executive assistant to C. F. Horner, president of the N. A. A., spoke on the aims and objects of the organization.

Visitors introduced included H. C. Whitney, director of the aviation division of the state road department; Capt. E. C. Nilson, director of the Orlando aviation department; G. Wayne Gray, Orlando aviation commissioner; Capt. J. R. Puckett, bureau of air commerce inspector and N. A. A. governor for Florida.

Ike Vermilya, manager of the Miami Aero Corporation, West Palm Beach; Guy Ball of Winter Haven, chairman of the aviation committee of the state junior chamber of commerce; Marvin Frasier, president of the Auburndale N. A. A. chapter; Thomas Ryan, president of the St. Petersburg N. A. A. chapter; G. T. Baker of St. Petersburg, president of the National Airlines system; Miss Charlotte Georgia, air hostess, National Airlines System; Charles R. Bentley of Lakeland, and Frank P. Ingram, state WPA administrator.

The meeting was closed with an entertainment program consisting of moving pictures of Florida air scenes, a floor show presented by Dave Barnum and a dance.

Tulsa, Oklahoma

By Frances Brown

The two-day session of the 8th Annual Meeting of the Women's National Aeronautical Association, convening at Tulsa, on May 14th and 15th, was well attended by members of the various units throughout the country, who came by plane, train and motor. Delegates began to arrive as early as May 12th, the first having traveled the greatest distance in the persons of Mrs. Dave Logg and Kitty Clyde Backus, all the way from Seattle, Washington. Mrs. Logg is president of the Seattle Unit and Miss Backus is the secretary, and making their acquaintance was one of the treats of the convention.

On May 13th a Waco cabin flew into Municipal Airport bringing the W. N. A. A. national president, Mrs. Carlos Reavis. Her husband, Colonel Reavis, engaged in the flying business in Denver, was pilot. With them was daughter Eileen Hazel, the youngest girl pilot in the state of Colorado. She came as a representative of "Wings," a group of pilots affiliated with the Denver W. N. A. A. Unit, and she had with her their mascot, "Donald Duck." Miss Eileen was wedging in the trip to Tulsa just before her graduation from high school. Also in the party was national corresponding secretary, Mrs. Carl Milliken, and Mrs. Earle O. Brown.

By train that same afternoon came Mrs. Orra Heald Blackmore, from Detroit. She is the founder of the W. N. A. A., and its honorary life president. Also by train arrived Mrs. Larry Neff from Denver, national recording secretary, who is vivacious and charming and has a host of friends throughout the Southwest.

The following day, Friday the 14th, was the opening of the convention, with registration at the Mayo Hotel beginning at nine o'clock in the morning, so the girls began pouring in from Dallas, Oklahoma City, Salt Lake City and Albuquerque.

The delegates from Albuquerque motored through and included Mrs. A. D. Smith, unit president; Mrs. Mark P. Beam, New Mexico W. N. A. A. governor; Mrs. C. C. Meacham, unit vice-president, and Mrs. Frank Speakman.

Flying in on the airlines from Salt Lake were Mrs. L. C. Higginbotham, Utah W. N. A. A. governor, and Mrs. B. Q. Van Cott, unit president. Mrs. Jean LaRene Foote flew in from Dallas, piloting a Stinson. The Dallas delegates coming by motor were Mrs. Stella B. Tryon, Mrs. K. Holman Henning, Mrs. F. C. Pettit and Mrs. Ben Bransom.

Undoubtedly many of the Oklahoma City members would have preferred to come by plane, but in order to assist the Tulsa unit with transportation for the convention events, they drove cars over. There was Mrs. Moss Patterson, unit president and western Oklahoma W. N. A. A. governor; Mrs. James Brazell, national treasurer; Mrs. Florence Dixon; Mrs. J. H. Burke, unit second vice-president; Mrs. Clyde Nuckols, unit treasurer; Miss Virginia Pieringer; Mrs. Mamie E. Parker; Mrs. Rex Rowland, unit first vice-president. Later came Mrs. Charles Schick, Mrs. J. L. Neyer, Miss Pearl Foster and Mrs. Hardy Young, all of Oklahoma City.

We should include Dorothy Pressler in the Oklahoma City travelers, even though it did develop later that she had quietly moved to Tulsa a few days before.

From Chicago by motor came Mrs. Schuyler B. Terry, national first vice-president.

Twenty-five members of the Tulsa unit attended all the events of the convention and were formally registered. They included Mrs. Gordon Wright, unit president; Mrs. W. G. Green, unit vice-president; Mrs. Rollin Gish, unit secretary; Mrs. A. M. Horrall, unit treasurer; Mrs. Russell Reeves, Mrs. Chriss Morgan, Mrs. W. S. Collier, second national vice-president, Mrs. Cleo Clifford, Mrs. John Armstrong, Mrs. A. M. Alcorn, eastern Oklahoma W. N. A. A. governor, Mrs. Willis C. Brown, Mrs. Helen Tribby, Mrs. E. W. Hudlow, Mrs. Joe Trimble, Mrs. John W. Wallace, Mrs. H. C. Duncan, Mrs. E. M. Wyatt, Mrs. Ralph Hahn, Mrs. Hillis Bell, Mrs. Fred Q. Casler, Mrs. W. V. Post, Mrs. O. W. Duncan, Miss Kathryn Malcom, Mrs. Redmond S. Cole. Mrs. Fritz Martin, a Tulsa unit member who resides in Shreveport, flew in from there. The rest of the Tulsa unit members attended a portion of the convention events. Miss Dorothy McBirney, 99er, of Tulsa, registered in the convention.

An important event of the convention was the election of national officers for the ensuing two years. The election took place on Saturday morning with the following results:

Mrs. Moss Patterson of Oklahoma City was elected national president; Mrs. Dave Logg of Seattle, first vice-president; Mrs. Gordon Wright of Tulsa, second vice-president; Mrs. Dorothy Pressler Morgan, Tulsa, secretary; Mrs. Mark P. Beam, of Albuquerque, treasurer; Mrs. Carlos Reavis, new governor-at-large.

The following directors were chosen: Mrs. George Shaw Greene of Dayton; Mrs. Grace Prescott of San Diego; Mrs. Clayton Patterson of Raleigh, N. C.; Miss Gerry Honomichl, of Dallas; and Mrs. Henry Boonstra of Salt Lake City.

The new official family was enthusiastically received by the entire convention. New national president, Nell Patterson, is well known and very popular throughout the Southwest, and the other members of the W. N. A. A. from distant units who became acquainted with her, felt at once her sincerity and charm of personality. She has a genuine interest in aviation, in the W. N. A. A. organization, and will devote a great deal of time during her presidency to promote the growth and aims of the association. In her officers she will have the cooperation of congenial and capable women, who have sensible and workable ideas on the part women may play in the furtherance of aeronautics.

During other convention business sessions, the general assembly adopted seven recommendations offered by the National Board, as follows: that aviation libraries be maintained by all units if feasible; that the W. N. A. A. present a trophy to the woman winning competitive races at the National Air Races; that the association present a membership trophy annually to the unit showing the greatest increase yearly in membership; that each unit president make an effort to contact outstanding women in aviation for the purpose of recommending them to the office of W. N. A. A. state governors; that special recognition be given to the unit having the most outstanding album of publicity; that each unit president act as a channel for information that the Air Defense League wishes published; that the association continue to publish its "Bulletin" of association news for dissemination among all W. N. A. A. members.

The project for the establishment of a National Scholarship Fund for Women Flyers, which was proposed last year, and which they have the sponsorship of both the W. N. A. A. and the 99 Club, was tabled pending further action by the 99 Club at its fall annual meeting.

The silver platter trophy for the largest increase in membership during the year was awarded to the Dallas unit, which at the time of the convention had a total membership of 49, and which unit was formed but a few months ago through the activity of Mrs. Andy Anderson, Texas W. N. A. A. governor, and Miss Gerry Honomichl, unit president.

The Tulsa unit received special recognition for having the best album of publicity.

We will now turn to the other features of the convention. On Friday, the 14th, the W. N. A. A. members had lunch at the Chamber of Commerce, as honor guests, together with officers of the Army and Navy Air Corps Reserves from Kansas City.

At the Municipal Airport that evening, seventy-five attended the buffet supper served in the lobby of the Administration Building. The table decorations, designed and made by Mrs. Corinne Armstrong, artist

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member of the Tulsa unit (and wife of "Johnny" Armstrong, manager of Tulsa Commercial Airport), consisted of miniature tom-toms, teepees and moccasins, so that out-of-town W. N. A. A. members would know they were in Indian country. During the buffet the Oklahoma City members gave each guest a beaded rabbit foot as a souvenir of the convention. Visitors saw the attractive club room of the Tulsa unit, which is in the Administration Building for the convenience of air travelers. Following the supper, the group drove to Mrs. Roberta Lawson's Tulsa residence to see her famous collection of Indian pieces, which is valued by museum curators at $250,000. Mrs. Lawson, president of the National Federation of Women's Clubs, is an honorary member of the Tulsa unit.

On Saturday, about noon, one hundred persons drove the fifty miles from Tulsa to the 4,000 acre ranch of Mr. Frank Phillips, near Bartlesville. This gave visitors from other parts of the country an opportunity to see some beautiful Oklahoma scenery and the most outstanding ranch in Oklahoma. While Mr. Phillips was unable to be there, Mrs. Phillips welcomed the convention and personally greeted each guest and supervised the serving of the lunch, which turned out to be more like a dinner, with barbecued elk and buffalo meat, vegetables and salads and dessert. Everyone was seated at long tables in the interesting Woolaroc Lodge, where the walls are covered with animal heads, and where, in every available spot, are beautiful rugs and pieces of Indian handicraft. Several persons at the Lodge who had not been in Tulsa were Billy Parker and his wife of Bartlesville to welcome the convention, which included Mr. Parker's mother, a member of the Oklahoma City W. N. A. A. unit. Mr. and Mrs. Leslie Bowman, of Dallas, were also at the Ranch. After the luncheon, the party wandered over the grounds and went through Woolaroc Museum, which contains relics and exhibits devoted to Indian life and to early Oklahoma. Mr. Phillips has been so generous in his hospitality that there is probably no need to go into further detail about the ranch to readers in the Southwest.

The banquet, beginning at 7:30 that evening in the Mayo Hotel, Tulsa, was open to all friends of aviation, and about two hundred were present. The retiring officers were introduced by Mrs. Reavis, and Mrs. Patterson then greeted the convention and introduced the newly elected national officers. Among the principal speakers were Mrs. Blackmore who talked on "The Bug That Bit US." Her interest in aviation began in connection with certain experiences in Italy in 1909, and she told how, many years later, she organized the W. N. A. A. in Detroit, at a time when the air mail routes were being established.

In introducing her new national secretary, Mrs. Dorothy Pressler, Mrs. Patterson made the surprise announcement that Dorothy and Merrill Morgan had been married that very afternoon, having quietly motored to Claremore for the ceremony while the convention was at the Ranch. This explained Dorothy's move to Tulsa, as Merrill is company pilot for a Tulsa concern. The bride and groom, both popular in this section, were given a big ovation.

Another speaker was Acee Blue Eagle, Indian artist associated with Bacone College at Muskogee, Oklahoma, who, while not a pilot, is an ardent patron of the airlines, which he uses whenever possible when traveling on his lecture and exhibit tours, both here and in Europe. Blue Eagle was dressed in an elaborate costume with full head-dress and lent a picturesque bit of color to the speakers' table. Loath to "talk about aviation to flying experts," Blue Eagle won applause by telling several of his pet Indian stories.

The concluding speaker was Ed Kerrigan, reporter of the Tulsa Tribune, who last spring made a transcontinental dash on the airlines.

The banquet was followed by a dance, and the convention was thus wound up in the wee hours, with the delegates all starting for their homes on Sunday.

Many interesting friendships are made at such conventions, and good fellowship is promoted, which in itself furthers the success and value of the association. To give an outsider's general impression of the W. N. A. A. convention we would like to quote an aviation editor well known in the Southwest, who wrote in his column, in part—"we never hope to see better cooperation than was displayed by members of the Women's National Aeronautical Association. . . ." We were proud to receive this compliment and are glad to say that this spirit of cooperation comes from the hearts of congenial women grouped together in a common interest.

Wichita, Kansas

By Creighton Merrell

Wichita aviation took a step ahead the past month with the formation of a local chapter of the National Aeronautic Association. A large number of local fliers are already members and many more will soon be placed on the list. At the first meeting staged May 20, the following officers were elected: Harry Gaines, president; Morris Brooker, vice-president; Harold Thomas, secretary, and Alanson Rawdon, treasurer.

At the invitation of the Hutchinson Aviation Club a mass flight from Wichita was made by local pilots in a total of more than twenty-five airplanes. The air was simply buzzing with airplanes ranging from the swift powerful Beechcrafts and Cessnas to the Cubs and

Cessna C-37 Approved As Seaplane

Dwane Wallace, president of the Cessna Aircraft Company, has just completed successful seaplane tests of an Edo float equipped Cessna C-37, receiving a formal ATC from the Bureau of Air Commerce.

All 1937 Cessnas will have the necessary fittings for float conversion. Earlier C-34 models are also eligible for seaplane license without alteration except for the addition of the two special fittings on the longerons.

Equipped with Edo 2425 floats and powered with the 145 h.p. Warner motor, the ship pictured above was licensed to a gross weight of 2500 pounds which, with a weight empty of 1595 leaves a useful load of 905 pounds. With this gross weight the ship cruises at 130 m.p.h. and showed a sea level top of well over 140 m.p.h. Take-offs from glassy water were negotiated in 30 seconds.

Aeroncas. It was a splendid turn-out from one city alone.

The group of pilots and passengers arrived at the Salt City about noon and were escorted to town for a luncheon. In the afternoon there were demonstration flights by the Beechcrafts piloted by Louise Thaden and Walter Beech and by a new Cessna flown by the indefatigueable Dwane Wallace. Stunting exhibitions by advanced student pilots followed.

A spectacular attraction was the 3,500 foot parachute jump made by Jimmie McGinnis, local student pilot, who jerked the rip cord for his first time. He made a nice 500 foot delay and a good descent until he finally stopped dead short of a very menacing hedge tree. Equipment and technical encouragement was furnished by the writer and a very fine but reluctant demonstration was given on the art of removing a parachute from a hedge tree without damage to the parachute but much infliction to the rescuer.

A splendid demonstration of how to collide with everything and yet live to tell about it was offered to Wichitans of late when H. M. Crandall, Jr., pilot, and Paul Ziegler, passenger cracked up while taking off from Swallow Airport in Hege Pup Velie powered monoplane. Crandall elected to take off east into a light breeze and over the factory buildings. The field was short and when the airplane neared the first building a jerk on the stick pulled it only high enough so the wheel could roll over the roof. With that obstacle cleared further stalling took the ship through high tension wires and across the highway. As the ship nosed down slightly it tore through the top of a tree head on while another tree farther ahead ripped off the left wing. At the last gasp the plane cartwheeled and shoved the nose through the roof of a garage in the Wichita Park Cemetery.

Pilot and passenger crawled from the ship without any serious injuries to face the wrath of the owner of the garage. Undaunted by disaster, however, they drove their own cars to town unaided and called it a day.

Wichita is proud of the record made by Beechcraft entered in the Frank Phillips trophy race at the St. Louis Rir Races. Art Chester won first place while flying a D17R Wright 420 h. p. biplane and Jack Gaty, Beech sales manager, held third position at the close of the race. Louise Thaden also made some noise by setting a new mark for women pilots over a 100 kilometer course by averaging 198 miles per hour in a stock model Beechcraft.

Dwane Wallace recently returned from Long Island, New York, where he completed Department of Commerce flight tests on a float equipped Cessna. The airplane cruises at 130 miles per hour with a top speed of 145. Rate of climb is 800 feet per minute. Dwane has turned out to be one of the most active pilot executives in the middlewest. In the fall of last year he obtained a private pilots rating and had about 80 hours at the time. Now his log book has recorded well up to 700 hours in the air and he is building up more time rapidly. So rapidly has his experience been built up that he now thinks nothing of setting out on a flight of well over 1,000 miles to any point on the compass.

Alanson "Dutch" Rawdon brought first honors to the tiny Dalrymple Special when he flew the Aeronca powered monoplane to victory in the Hastings Air Races event for airplanes having not more than 50 horsepower. In the contest held at Hastings, Nebraska, he easily lapped all the Aeronca and Cub contenders with margin although the engine develops under 30 horsepower. Since the airplane did not carry a Department of Commerce license the prize money was denied to Rawdon but he will receive a handsome cup for his victory in a few

(Continued on Page 34)

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1935 Fairchild "24" without flaps. Majored fifty hours back. Bank and turn, radio receiver, oil radiator, generator, electric starter. A real buy for $2700.00.

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The airplanes listed below are now in service and are not trade-ins. They are being sold to make way for new equipment.

One 1936 WACO STANDARD CABIN, 225 HP Jacobs engine. Ambulance equipment. Diana cream trimmed in red. About 100 hours total time and perfect in every detail. Complete instrument installation, radio and strut air-brakes. Cost over $7000. First check for $4500 takes it.

One 1934 WACO DELUXE CABIN, 250 HP Wright engine. Curtiss blue with ivory trim. Ship now being completely overhauled and refinished, hand-rubbed. Engine majored one hundred and forty hours ago. Complete instrument installation, radio and strut air-brakes. Cost $9800 new. Outstanding in performance, appearance and value. $3750.

1937 DELUXE REARWIN SPORTSTER, 90 HP LeBlond motor. Ball-bearing controls, hand-rubbed paint insignia blue with ivory trim, speed-ring, new wide landing gear, brakes, Kollsman compass, air cleaner, carburetor heater, tail-wheel, etc. Less than 100 hours total time. Cost new $3450. Will discount $500.

CURTISS FLEDGLING, 185 HP Challenger engine. Now in service as blind-flying training ship, and has hood and complete instruments but no radio. Ship in excellent condition, but engine needs top overhaul. Curtiss-Reed propeller. French gray fuselage with Berry red wings and tail group. As equipped $850, or without special instruments $750.

1936 TAYLOR CUB, A-40-3 Continental engine. Less than 300 hours total time. Special paint, Berry red with black trim. Enclosed. Roller-bearing wheels. Will give motor top overhaul before delivery. $1050.

If you are interested in a new STINSON, REARWIN or TAYLOR CUB we will be glad to arrange a demonstration.

We have new TAYLOR CUBS in stock for immediate delivery.

HANGAR SIX, INC.

Stinson Field San Antonio

"BETTER AIRPLANES FOR LESS"

50% Down — Balance 12 Months

BEECHCRAFT Jacobs 225 h. p., total time 580 hours. 120 hours since major. Blind flying instruments. Two-way radio. $5500.

STINSON 1936, Lycoming 245. Total 194 hrs. Blind flying instruments. Smith electric controllable, landing lights, flares. Airplane like new, many extras. $6000.

WACO 1935 Standard, Jacobs 225. Total 325 hrs. 21 hours since top. All instruments, 70 gallon gas tanks, two band receiver, perfect condition. $3450.

LOCKHEED VEGA Wasp 420. Gross load 4750 lbs. 7 place. Airline equipment. Relicensed to 1938. Make offer.

FAIRCHILD 24, Warner 145. Less than 50 hours since major. Generator, radio, complete blind flying instruments, wheel pants, duals. $2500.

AERONCA Master C-3, 1936. Brand new. Total time 14 hours. $400 down, balance 12 months. $1100.

DAVIS Model D-1, LeBlond 65 h. p. Two place open, licensed to June, 1938. $525.

Good used instruments for sale.

P. F. (POP) HOTCHKISS

MUNICIPAL AIRPORT FORT WORTH, TEXAS

BARGAINS

WACO 1934 Custom built, 225 Jacobs. Color: green. Lux fire extinguisher, head temperature gauge, Lear two-band radio, bank and turn, rate of climb, clock, landing lights and flares. Licensed til May, 1938. Total time on ship 1010 hours. Total time on engine since new: 260 hours. PRICE $2,737.

STINSON J-6-5, new cover, new upholstery, cowling ring, steel propeller, Heywood starter. A real buy: $775.00.

WASP C engine $350. WASP B $250.

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EXPERIENCED TRANSPORT PILOT, age 27, with A. & E. Mechanics License, desires combination flying and maintenance postion that offers good future, preferably in Southwest. Excellent references furnished on application. Eight years varied experience with all types of equipment. Write or wire Box 1020, Southern Flight, Ledger Bldg., Fort Worth, Texas.

Licensed A and E Mechanic. Six years experience. Best of references. Want connections with airport or private operator. Box 203, Southern Flight. Ledger Bldg., Fort Worth, Texas.

EXPERIENCED transport pilot, speaks Spanish, plenty of night flying and cross-country experience in United States and Latin American countries, desires flying position with individual or commercial operator. Excellent references furnished. Box 205, c/o SOUTHERN FLIGHT, Ledger Building, Fort Worth, Texas.

MISCELLANEOUS EQUIPMENT FOR SALE

Have good used Irving quick connector lap pack and Switlik seat pack for sale. All models of used chutes available in various price ranges. Packing and repair of chutes a specialty. Merrell Parachute Sales & Service, 625 North Topeka, Wichita, Kansas.

PILOTS EXAMINATION questions made easy. Send for up-to-date Quiz System, giving questions and answers on aircraft, engines, meteorology, navigation and Dept. of Commerce regulations. Prepare yourself to pass. Mailed postpaid for $2.00. Address Quiz System, 321 Griesheim Bldg., Bloomington, Illinois.

Ports of Call

(Continued from Page 32)

days. In acrobatic flying he gave a splendid demonstration of the flying qualities of the small craft by gaining altitude while slow rolling and other such maneuvers.

So reliable has the airplane proven that Rawdon will tour with the Oklahoma Air Tour party over the first half of the route laid out. Since the territory to be covered is quite extensive it is certainly a fine demonstration of the performance of the craft which flies 120 miles per hour high speed.

West Palm Beach, Florida

By Art Keil

Aviation Day in West Palm Beach, as an integral part of Florida Aviation Week, will be handled by the newly organized Palm Beach County Chapter of the National Aeronautic Association.

Designated as an overnight stop on the Florida Air Tour which will cover all principal ports in the state from June 21 to June 26, West Palm Beach is planning for an elaborate program. The pilots are due at Morrison Field on the afternoon of June 25 after hopping from Orlando to Daytona Beach, St. Augustine, Jacksonville, Lake City, Gainesville, Ocala, Tampa, St. Petersburg, Winter Haven, Lakeland, Wauchula, Avon Park, Sebring and Oeechobee City, during the first four days of the tour.

The NAA chapter plans a big reception at Morrison Field where Manager Jim Turnage has been planting shrubbery and sprucing up the surroundings in preparation for the show. Either a dinner dance or beach barbecue will be the order of the evening, depending upon a later decision of the entertainment committee.

The tour will leave West Palm Beach about 11 o'clock the following morning in time to arrive over Bay Front park in Miami to participate in the "Parade of Progress" at noon, when as many ships as possible will be assembled. It is expected a half dozen planes will join the tour at West Palm Beach for the final hop and a share of the Miami festivities.

Mayor S. D. Morris of West Palm Beach and Mayor James M. Owens of Palm Beach are issuing formal proclamations urging the people of both communities to participate in the Aviation Day and to join the throng at Morrison Field for the air maneuvers. Interest in aviation has been stimulated generally since completion of Morrison Field and the inaugural airmail flight last December. Formation of the Palm Beach County chapter of NAA, which is expected to further increase aviation interest has just been completed under leadership of the West Palm Beach Chamber of Commerce aviation committee. W. A. Wall, chairman of that committee, who headed the group sponsoring airport dedication activities, was elected president by acclamation when the report of the nominating committee was received.

G. Leland Hatch, former president of the chamber of commerce, was named vice-president; Postmaster O. B. Carr was elected treasurer; and Larry P. Hoffman, chairman of the Junior Chamber of Commerce aviation committee, was made secretary. In addition to the officers the board of directors includes Stanley Peeler, president of the chamber of commerce; Frederick G. Seelmann, president of the Palm Beach County Airport association, and James L. Turnage, Morrison Field manager. Two more members representing outlying sections of the county will be added to the directorate later.

National and state aviation officials met here recently when Major A. B. McMullen, chief of the airport division, Department of Commerce, conferred with H. C. Whitney, state aviation director, and his assistant, W. G. Stewart, who had served with Major McMullen when he headed the Florida service. The state men were making a tour of the state in the interests of Florida Aviation Week.

Inspection of Morrison Field was made recently by a committee of Fort Lauderdale men interested in development of Fogg airport there, the group including H. W. Langmead, director of aviation for the city; August Burghard, secretary of the chamber of commerce, and J. H. Philpott, city engineer.

More than 3,000 residents of West Palm Beach and Palm Beach gave trans-Atlantic fliers Dick Merrill and Jack Lambie an enthusiastic welcome when they resumed their regular run between Newark and Miami. The pilots had not been advised of the reception planned in honor of their successful Coronation hop and were quite obviously embarrassed by the adulation of the crowd. Mayor S. D. Morris of West Palm Beach reminded Pilot Merrill that the city makes a special claim on him because of the fact that he flew the plane from Morrison Field last December on Eastern Air Lines' inaugural passenger-mail run. Eighty members of the state championship high school band were provided transportation to the airport and serenaded the fliers.

Bendix Aviation Expands

Another move in the nation-wide expansion of the activities of the Bendix Aviation Corporation was announced recently by Vincent Bendix. This latest development is centered in California where several other Bendix enterprises have made news during the last year.

Mr. Bendix stated that a 20-year lease had just been taken upon two large hangars at Burbank Airport, Los Angeles. One of these hangars is already operated by Bendix Aviation through its subsidiary, Pacific Aeromotive Corporation.

"We are enlarging our aircraft and automotive operations in California," said Mr. Bendix. "Both plant facilities and personnel are being expanded. In addition to the two hangars we have just taken an option on a large piece of adjoining vacant property on Burbank Airport for possible future expansion."

S. F. Dupree, Jr., president of All Metal Universal Joint Co., Cleveland, has been engaged to take charge of the Bendix Automotive division in southern California under the direction of Palmer Nichols, general manager of both the automotive and aircraft divisions, Mr. Bendix stated.

In-Lines in Demand

(Continued from Page 17)

but is necessary to the airplane builders. Consequently, engine literature is written to include the technical engineering data required by plane manufacturers and is of little or no use to the average individual who is more interested in the plane complete with power plant and ready to fly.

More new commercial planes are being contemplated around the inverted, in-line, and air-cooled engines. The planes described above are making a definite stride in private plane sales and at the same time setting a new pace which virtually eliminates competition excepting from such planes that can perform in a comparable manner. This means superior streamline from propeller hub to the trailing edge of the rudder. In-line engines are in demand for the part they play in providing this clean streamline as well as reliable and economical power performance.

There is little romance connected with the manufacturing of aircraft engines but nevertheless it remains a vital part of the aviation industry.

Lockheeds to Varney

Lockheed Aircraft Corporation announces the delivery of two of its all-metal, twin-engined Lockheed 12's to Varney Air Transport, Inc. The planes are the first of a fleet of these 226-mile an hour planes to be placed on the air mail route AM-29 flying between El Paso, Texas, and Pueblo, Colorado. Stops are made at Albuquerque, Santa Fe, Las Vegas (N. M.), and Trinidad, Colorado.

Avery Black, president of the air line, accompanied Lockheed's assistant test pilot, E. C. McLeod, on the first flight from Burbank to El Paso. After a few weeks of test flying and a readjustment of schedules due to the high speeds available in the new planes, the ships will be placed in regular service. From the tip of Texas, Varney Air Transport flies to Pueblo where direct connections are made for Denver and points north.

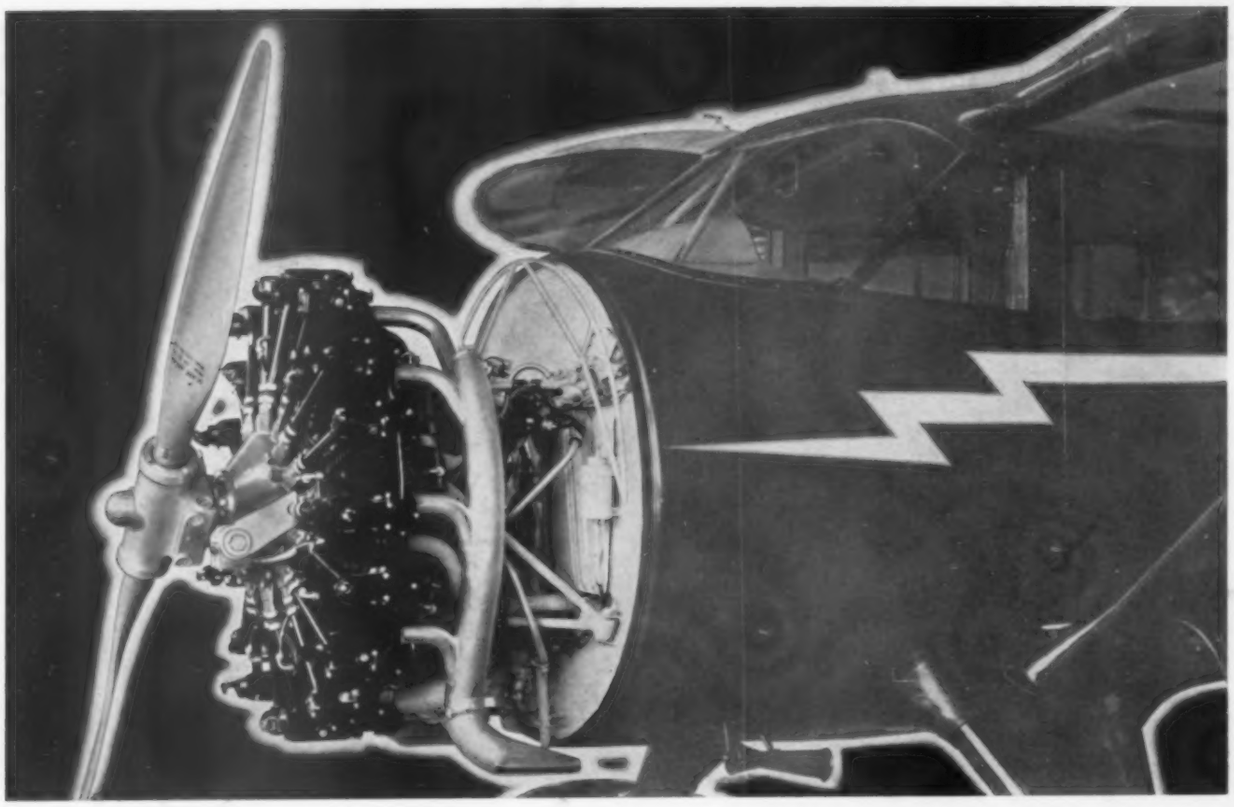
These are the first of the Lockheed 12 six-passenger type to be ordered by an air line. Although nearly 45 of this model have been ordered since its introduction in June, 1936, all of the planes delivered up to this time have been for private or governmental service.

Electricity-on duty 24 hours a day at Meacham Field

• In the Administration Building tower (above, left) electricity performs a thousand and one duties. Clocks, radios, flood lights, landing-light indicators and a lot more very important gadgets all depend on electricity for their operation. In the building itself (above, right) electricity again goes to work in dozens of different ways, all of which are important functions in the carrying-on of aviation activities. Runways are definitely outlined at night by sturdy, weather-proof lighting units built into the ground (below, right).

More power to the aviation industry—and electricity will keep step with its progress.

TEXAS ELECTRIC SERVICE COMPANY



NOW--100 Hours Between Engine Checks

Save $75.00 Every 100 Flying Hours

The R-680 Lycoming Engine became famed in the early 40's for reliability and low maintenance costs. Continued improvements through use by Airlines, the U. S. Government, Operators, and Private Flyers has kept this product ahead of its field, outselling all other makes in this power class.

The new R-680-D Lycoming Engine is destined to create another HIGH in dependable performance and low operating cost because its design embodies enclosed rocker-arm boxes with pressure lubrication through cam followers and push rods to rocker arm bearings, super-finned cylinder heads cooling BOTH intake and exhaust sides, Nitralloy accessory drive shaft, deep bossed aluminum crank case and other notable improvements found only in the latest pursuit and airline engines.

Stinson has followed the same consistent program of constant improvement without basic, obsoleting changes and now produces, through refinements in design and manufacturing technique, an airplane which is acknowledged to be the most advanced, as regards safe, trouble-free operation, of any airplane in the entire cabin category.

Proof of this is the fact that more knowing and experienced buyers now own 1936-37 models of the Stinson 'Reliant' than all other makes of 4- 5- or 6-place cabin planes combined and that again Stinson Owners and Flyers have traveled more than 6,000,000 miles in the first quarter of 1937 without an accident which resulted in a fatality to pilot or passenger.

Higher Powered 'Reliants' also Lead in Sales

The 320 HP Wright-powered 'Reliant' also leads. More of this model have been sold to substantial people during 1936-37 than all makes of cabin planes combined in this power class.

The 'Reliant' powered with the Wasp Jr. (450 HP) is now in production and gives "A TRANSPORT RIDE AT AIRLINE SPEED. Orders already booked assure leadership for this outstanding airplane in the higher-powered category.

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